HONORS CHEM 1st Semester Study Materials

Please be understanding if any of these Study Materials change, I am attempting to predict what we will cover and use for the entire school year...this is my best guess!

Contains Study Materials for the following chapters.

- Unit 1 Chemistry Basics and Atomic Structure
- Unit 2 Nuclear Chemistry
- Unit 3 Electrons
- Unit 4 Periodic Table
- Unit 5 Bonding and Structure
- Unit 6 Reactions
- Unit 7 Stoichiometry

Units 8-14 are in a separate Study Materials photocopy packet.

Review Topics and One Pager Instructions on back of this paper. Do the One Pager on this side of the page. Period: Seat#:

Name:

Dougherty Valley HS Chemistry Chapter #1 – Review Topics and One Pager

This is a general list of some of the topics we have covered this chapter. These are suggested study topics, <u>not</u> a definitive list. You can/will be assessed on not just whether you have memorized the material, but also if you can apply the information to a new scenario/situation/context/example. Remember – there is a difference between "knowing" something and truly "understanding" something – memorization vs applying!

- Metric System
- Metric Conversions
 - Scientific Notation
- Significant Figures
- Density

- Dimensional AnalysisChemical vs. Physical
- Changes
- Chemical vs. Physical Properties
- Types of Matter atoms, compounds, pure substances, mixtures
- Parts of the atom
- Atomic #s and Isotopes
- Average Mass Calculations
- **One Pager Instructions**

A one-pager is a written and graphic interpretation of what you've learned presented on a single sheet of paper. In this case, you will demonstrate that you have successfully practiced strategies commonly used by effective learners. The one-pager will help showcase your thoughts and will provide a reference for later review or further study of the topics.

Guidelines:

• Use 8.5 x 11" unlined paper Include all required information Needs to show a high level of effort, (you will use the front of this paper). (arrange it on page any way you choose). detail, thought, and care. This is not • Must show higher level THINKING and something you scribble out during brunch • Fill the entire paper PROCESSING of the information, not just before class starts! • Writing must be in ink, no pencil. • Must be clear, easy to read, understandable regurgitating every fact you learned. • Use color for illustrations. **Required Information:** Chapter number and title Visual representations of the important aspects of the chapter Must address all the Review Topics above Two higher level questions about the concepts INCLUDING answers. These are not calculations to solve. Key equations (with names of equations if applicable). Two annotated/explained "representative practice problems" List of key concepts/topics for any topics related to math. If no math in the chapter then does not need to be included. Five most important vocabulary words/terms A 10 sentence paragraph that summarizes and connects the Explanations of words or ideas that correspond to the chapter information together. Will be done below on this side of the A "warning" or "tips" section paper.

Ten Sentence Summary - Pretend you are writing a little miniature textbook selection for this chapter!

Review Topics and One Pager Instructions on back of this paper. Do the One Pager on this side of the page.



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Dougherty Valley HS Chemistry Chapter #2 – Review Topics and One Pager

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- Nuclear Basics
- Types of radioactive particles

- Symbols, charges, strengths of radioactive particles
- Writing nuclear equations
- Decay series
- Half Life Calculations

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<u>Re</u>	quired Information:				
	Chapter number and title			Visual repres	entations of the important aspects of the chapte
	Must address all the Review Topics above	applicable)		Two higher le answers. The	evel questions about the concepts INCLUDING ese are not <i>calculations</i> to solve.
	List of key concepts/topics	аррисаріе).		Two annotat for any topic	ed/explained "representative practice problems" s related to math. If no math in the chapter then
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Dougherty Valley HS Chemistry Chapter #3 – Review Topics and One Pager

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- Types of orbitals
- **Orbital numbers**
- Orbital diagrams
- Electron configuration rules
- Writing Electron configurations with just the periodic table
- Electron configurations of ions
- Noble Gas
- Absorption and emission spectra

One Pager Instructions

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- Configurations

Dougherty Valley HS Chemistry Study Guide Test #1



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Chemistry Basics and Atomic Structure

- Chemistry Math
 - o Know the equation for Density
 - Know how to solve for each variable in the Density equation +
 - Know the common metric prefixes (KHDBdcm)
 - Be able to perform metric conversions using either "King Henry" or Dimensional Analysis +
 - Know how to perform "single" and "double" unit dimensional analysis problems +
 - Know how to count the number of significant figures in a given number
 - Know how to carry significant figures through a calculation to report the final answer with the correct number of sig figs +
- Properties of Matter
 - o Be able to tell the difference between a physical property and a chemical property
 - Be able to tell the difference between a physical change and a chemical change
 - Know examples for each type of property
 - Know examples for each type of change
 - Know each type of classification of matter (Pure Substance, Element, Compound, Mixture, Homogeneous, Heterogeneous)
- Atomic Structure
 - Know each type of subatomic particle (Proton, Neutron, Electron)
 - Know the difference between their charges, location, etc... for each type of subatomic particle
 - Be able to describe and explain the experiment that lead to the discovery of the electron
 - Be able to describe and explain the experiment that lead to the discovery of the nucleus
 - Know the different models of "atom" and be able to sketch or identify a simple version of each
 - Democritus
 - J. Dalton (billiard ball)
 - J.J. Thompson (plumb pudding)
 - N. Bohr (planetary model)
 - E. Rutherford (atomic nucleus)
 - J. Dalton
 - Quantum Model
- Atomic #'s
 - o Know the difference between Atomic #, Atomic Mass, Mass Number, Isotope
 - Know how these terms relate to each other so you can calculate things such as the number of protons, neutrons, electrons, and mass of a given atom +
 - Know how to calculate the average atomic mass when given the relative abundances of various isotopes +
 - Know how to calculate the % relative abundance of two different isotopes when given the average mass (limited to doing two isotopes) +

Nuclear Chemistry

- Basics
 - \circ Be able to describe the difference between Chemical Reactions and Nuclear Reactions
 - Be able to describe and identify nuclear fission, nuclear fusion, neutron bombardment
 - Be able to describe the different types of radioactive decay charges, masses, symbols, penetration power, what stops them, what charge are they attracted to, where/how they originate (alpha, beta, gamma, positron) (α , β , γ)
 - Know some pros and cons about nuclear chemistry (medicine, power plants)
- Equations
 - o Identify types of equations or particles when shown an equation
 - Alpha, beta, gamma, positron, fission, fusion, neutron bombardment
 - Be able to write nuclear equations involving α , β^+ , β^- , γ , neutrons and protons +
 - Find the missing part when given most of an equation
 - Write the equation when given it in words
 - $\circ~$ Be able to write and graph a decay series
- · Half-Life
 - o Definition
 - Find the half-life when given a chart or a graph
 - Equations +
 - Know the equation for half-life: $A_E = A_S \times 0.5^n$
 - Know how to calculate the number of half-lives: $n = \frac{t}{h}$
 - Know how to solve for A_E and A_S
 - Know how to calculate the % still radioactive: $\%_{still \ radioactive} = 0.5^n$
 - Know how to calculate the % decayed: $\%_{decayed} = 100\% \%_{still radioactive}$
 - Know how to calculate the amount decayed into stable: $A_{decayed} = A_S A_E$
 - Know how to use logarithms to solve for t or h (isolate the one you are looking for): $\log\left(\frac{A_E}{A_S}\right) = \frac{t}{h} \times \log(0.5)$

Electrons

- Orbitals
 - Know the definition of an orbital
 - Know how many shapes/types of orbitals there are
 - Know how many of each shape/type of orbital there are in a "set"
 - Know how many electrons can fit inside an individual orbital
- Orbital Diagrams
 - Know the rules for filling an Orbital Diagram and be able to apply them to filling out an orbital diagram
 - Hund's Rule
 - Pauli Exclusion Principle
 - Aufbau Principle
- Electron configuration
 - Be able to write the electron configuration for:
 - An atom using an orbital diagram
 - An atom using only the periodic table
 - An ion
 - Noble gas configuration
 - Absorption and Emission
 - o Know how absorption and emission work and be able to sketch a picture of each
 - Describe how Absorption and Emission Spectra can be used to identify elements present in a sample or in a star

Dougherty Valley HS Chemistry Fall Test #1 - Practice Packet



This practice packet is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test.

1) Organize the matter into the four types of matter and explain your answer.

		/ / /
Matter	Туре	Explanation
Gasoline		
Uranium		
Orange Juice		
Methane (CH ₄)		

2) Organize the changes below as physical or chemical and explain your answer.

Action	Change	Explanation
Melting of gold		
Cooking meat		
Digesting food		
Charcoal drawing		

- 3) Explain the difference between the mass number and the average atomic mass number.
- 4) How many protons neutrons and electrons are in the elements below?

Element	Proton #	Electron #	Neutron #	Mass #
Nitrogen - 16				
²⁴⁶ ₉₄ Pu				
Most abundant Iron atom				
$^{37}_{17}Cl^{-1}$				

- **5)** Chlorine has two isotopes ³⁵Cl with a mass of 34.968852g and ³⁷Cl with a mass of 35.965903. The percentage of these isotopes are 75.77% and 24.23% respectively. What is the average atomic mass unit of chlorine?
- 6) A sample of element X contains 100 atoms with a mass of 12.00 and 10 atoms with a mass of 14.00. Calculate the average atomic mass (in amu) of element X.
- 7) What is an alpha particle and what caused it to change course in the gold foil experiment?
- 8) Describe in detail everything the gold foil experiment taught us about the structure of the atom
- **9)** Carbon-14 measurements on the linen wrappings from the Book of Isaiah on the Dead Sea Scrolls indicated that the scrolls contained about 79.5% of the carbon-14 found in living tissue. Approximately how old are these scrolls? The half-life of carbon-14 is 5730 years.
- **10)**Phosphorus-32 is a radioactive isotope used as a tracer in the liver. How much phosphorus-32 was originally used if there is only 3.50 mg left in a sample after 288 h? (The half-life is 14.3 days.)
- **11)**Show plutonium 239 going through two alpha decays.
- **12)**The isotope Uranium 238 undergoes a alpha decay and then two beta decays what is your final elemental isotope product?

Dougherty Valley HS Chemistry Fall Test #1 – Practice Test

- 1. Express 1570000 in scientific notation.
 - A) 4.62×10^{-8}
 - 1.57×10^{-6} B)
 - C) 1.57×10^{6}
 - D) 157×10^{6}
 - E) 157×10^{4}
- Express 30514000 in scientific notation.
 - A) 3×10^{7}
 - 3.0514×10^{7} B) 305×10^{7}
 - C) D) 30514×10^{3}
 - 305140×10^{7} E)
- 3. The number 0.005899 expressed in scientific notation is
 - A) 5.90×10^{3}
 - B) 5.899×10^{3}
 - C) 5.90×10^{-3}
 - D) 5.899×10^{-3}
 - E) 5899×10^{-6}
- Express the number 0.00346 in scientific notation. 4.
 - 3.46×10^{-3} A)
 - B) 3.46×10^{3}
 - C) 0.346×10^{-3}
 - D) 346×10^{-5}
 - E) none of these
- 5. 1.5 kilogram(s) contains this many grams:
 - $1.5 \ge 10^2$ A)
 - $1.5 \ge 10^3$ B)
 - C) 15
 - 0.15 D)
 - E) 1.5 x 10⁻³
- 6. The volume of a helium balloon is 2.4 L. What is this volume in cm^3 ? (1 L = 1 dm³)
 - 24. cm³ A)
 - $2.4 \times 10^3 \,\mathrm{cm}^3$ B)
 - C) $2.4 \times 10^2 \,\mathrm{cm}^3$
 - D) 0.24 cm³
 - $2.4 \times 10^4 \, \text{cm}^3$ E)
- 7. The element curium (Z = 242, A = 96) can be produced by positive-ion bombardment when an alpha particle collides with which of the following nuclei? Recall that a neutron is also a product of this bombardment.
 - $^{249}_{98}{
 m Cf}$ A)
 - B) $^{241}_{94}$ Pu
 - $^{241}_{95}Am$ C)
 - D)
 - ²³⁹₉₂U
 - $^{239}_{94}$ Pu E)
- 8. The iodine-131 nuclide has a half-life of 8.0 days. If you originally have a 623-g sample, after 2.0 months you will have (Ignore sig figs for this problem.)
 - A) 46 g
 - B) 54 g
 - C) 120 g
 - D) 3.4 g
 - E) less than 1 g
- 9. A radioactive element has a half-life of 2.00 weeks. What % of the original sample is left after 19.5 days?
 - 38.1% A)
 - B) 60.8%
 - C) 61.9%
 - 1.39% D)
 - none of these E)

- 10. A sample of a radioactive element decays to 27.5% of its original amount of radioactive nuclides in 15 years. What is the half-life of this radioactive element?
 - 32. years A)
 - B) 2.5 years
 - C) 8.1 years
 - 91.9 years D)
 - 8.6 years E)
- 11. A radioactive element has a half-life of 1.20 years. What % of the original sample is left after 168.1 days?
 - 23.4% A)
 - 76.6% B)
 - C) 38.3%
 - D) 25.5%
 - 16.4% E)
- 12. The measurement 3.3×10^3 g also could be written as
 - A) 3.3 g
 - B) 3.3 mg
 - 3.3 pg C)
 - 3.3 kg D)
 - 3.3 dg E)
- 13. Which metric prefix is used to designate 1000?
 - A) m
 - B) Μ
 - C) k
 - D) с
 - E) d
- 14. Which of the following is an SI unit for expressing the mass of a block of Au?
 - A) m
 - B) g
 - C) L
 - D) pound
- 24. Calculate the mass of a rectangular solid that has a density of 3.87 g/cm^3 and measures 2.50 cm by 1.80 cm by 3.00 mcm.
 - 3.49 g
 - A) B) 52.2 g
 - C) 9.68 g
 - D) 28.3 g
 - E) 55.2 g
- 25. Find the volume of an object that has a density of 3.14 g/mL and a mass of 55.0 g.
 - 17.5 mL A)
 - B) 5.71 x 10⁻² mL
 - C) 173 mL
 - 1.75 x 10⁻² mL D)
 - 1.73 x 10⁵ mL E)
- 26. An object has a mass of 40.1 g and occupies a volume of 6.09 mL. The density of this object is

27. The density of an object that has a mass of 4.48 g and

- 244 g/mL A)
- B) 0.152 g/mL

40.1 g/mL

4.48 g/mL

1.20 g/mL

3.73 g/mL

0.27 g/mL

5.38 g/mL

too low to measure

occupies a volume of 1.20 mL equals

C) 6.58 g/mL

D)

E)

A)

B)

C)

D)

E)

- 31. The half-life of a radioactive nuclide is
 - A) that period of time in which 25% of the original number of atoms undergoes radioactive decay.
 - B) the time at which the isotope becomes nonradioactive.
 - C) that period of time in which 50% of the original number of atoms undergoes radioactive decay.
 - D) the period of time it takes to reduce the radioactivity by 100%.
 - E) none of the above
- 33. The state of matter for an object that has neither definite shape nor definite volume is
 - A) solid
 - B) liquid
 - C) gaseous
 - D) elemental
 - E) mixed
- 34. Which of the following involves a chemical change?
 - A) boiling water
 - B) melting ice
 - C) chopping wood
 - D) cooking an egg
 - E) none of these
- 35. Which of the following is a physical change?
 - A) burning gasoline
 - B) cooking an egg
 - C) decomposing meat
 - D) evaporating water
 - E) rusting iron
- 36. Which of these is a chemical property?
 - A) Ice melts at 0° C.
 - B) Oxygen is a gas.
 - C) Helium is very nonreactive.
 - D) Sodium is a soft, shiny metal.E) Water has a high specific heat.
- E) Water has a high specific heat.37. Which of the following involves no chemical change?
 - A) burning paper
 - B) boiling water
 - C) baking a cake
 - D) lighting a match
 - E) driving a car
- 38. Which of the following is only a physical change?
 - A) Sugar dissolves in coffee.
 - B) Cookies burn in the oven.
 - C) A banana ripens.
 - D) Leaves turn colors in the fall.
 - E) At least two of the above (a-d) exhibit only a physical change.
- 39. Which of the following is a chemical change?
 - A) Water condenses on a mirror.
 - B) A damp towel dries.
 - C) Peanuts are crushed.
 - D) A "tin" can rusts.
 - E) At least two of the above (a-d) exhibit a chemical change.
- 40. An example of a chemical change is
 - A) boiling alcohol
 - B) grinding coffee beans.
 - C) digesting a pizza
 - D) coffee spilled on a shirt
 - E) an ice cube melting in a drink
- 41. In a chemical change,
 - A) a phase change must occur
 - B) the original material can never be regenerated
 - C) a phase change never occurs
 - D) the products are different substances from the starting materials

- 42. Which of the following describes a chemical property of gold?
 - A) Gold is a yellow metal.
 - B) Gold is an inert (nonreactive) metal.
 - C) Gold is a soft metal.
 - D) Gold is a very dense metal.
 - E) Gold is a good conductor of heat and electricity.
- 43. Which of the following is a chemical change?
 - A) water boiling
 - B) gasoline evaporating
 - C) butter melting
 - D) sugar dissolving in water
 - E) paper burning
- 44. How many of the following are pure compounds? sodium, sugar, oxygen, air, iron
 - A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5
- 45. Which of the following is an element?
 - A) air
 - B) water
 - C) salt
 - D) helium
 - E) sugar
- 46. An example of a mixture is
 - A) hydrogen fluoride
 - B) purified water
 - C) gold
 - D) the air in this room
 - E) all of these
- 47. An example of a pure substance is
 - A) elements
 - B) compounds
 - C) pure water
 - D) carbon dioxide
 - E) all of these
- 48. A homogeneous mixture is also called _____

49. Which of the following processes require(s) chemical

Distilling a saltwater mixture.

Separating a homogeneous mixture into pure

Separating a heterogeneous mixture into pure

Breaking a compound into its constituent elements.

Dry ice sublimes when left on the demo table in lecture.

Liquid nitrogen dumped onto the floor vaporizes at room

None of the above processes are chemical changes.

The light on a candle burns until a bell jar is placed over it for a

When a few drops of red food coloring are added to a beaker of

At least two of the above (a-d) require chemical

50. Which of the following processes is a chemical change?

hot water, the water immediately turns red.

- A) a heterogeneous mixture.
- B) a pure substance.
- C) a compound.
- D) a solution.
- E) an element.

substances.

substances.

methods.

period of time.

temperature.

methods?

A)

B)

C)

D)

E)

A)

B)

C)

D)

E)

- 51. A ______ change involves a change in one or more physical properties, but no change in the fundamental components that make up the substance.
 - A) chemical
 - B) physical
 - C) mixed
 - D) Potential
 - E) Kinetic
- 52. A ______ change involves a change in the fundamental components of the substance; a given substance changes into a different substance or substances.
 - A) chemical
 - B) physical
 - C) mixed
 - D) potential
 - E) kinetic
- 58 How many of the following did Dalton not discuss in his atomic theory? Isotopes, ions, protons, electrons, neutrons
 - A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5
 - 59. Which of the following statements are true?
 - I. Models are always wrong unless they are proved by a theory. II. Elements, such as lead, are made of tiny particles that mostly consist of open space.
 - III. The air you breathe is an example of a heterogeneous mixture. IV. Because NH_3 always contains the same relative numbers of atoms, it will always contain 4.6 g of nitrogen for every 1.0 g of hydrogen.
 - A) II only
 - B) II, IV
 - C) I, II, IV
 - D) I, III
 - E) All of the above statements are true.

26. C **Answer Key** 5. B 11. B 27. C 6. B 12. D 1. C 7. E 13. C 31. C 8. D 2. B 14. B 33. C 3. D 9. A 24. B 34. D 4. A 10. C 25. A 35. D

- 4. A line spectrum is produced when an electron moves from one energy level
 - a. to a higher energy level.
 - b. to a lower energy level.
 - c. into the nucleus.
 - d. to another position in the same sublevel.
- 5. Because excited hydrogen atoms always produce the same lineemission spectrum, scientists concluded that hydrogen
 - a. had no electrons.
 - b. did not release photons.
 - c. released photons of only certain energies.
 - d. could only exist in the ground state.
- 6. For an electron in an atom to change from the ground state to an excited state,
 - a. energy must be released.
 - b. energy must be absorbed.
 - c. radiation must be emitted.
 - d. the electron must make a transition from a higher to a lower energy level.

- 63. Which particle has the smallest mass?
 - A) neutron
 - B) proton
 - C) electron
 - D) helium nucleus
- 64. How many protons, electrons, and neutrons,
 - respectively, does 127 I have?
 - A) 53, 127, 74
 - B) 53, 74, 53
 - C) 53, 53, 127
 - D) 74, 53, 127
 - E) 53, 53, 74
- 65. How many protons, electrons, and neutrons,

respectively, does ¹⁶O have?

- A) 8, 18, 8
- B) 8, 8, 8
- C) 8, 10, 8
- D) 8, 14, 8
- E) 8, 18, 16
- 66. An atom with 15 protons and 16 neutrons is an atom of
 - A) P
 - B) Ga
 - C) S
 - D) Pd E) Rh
- 67. A certain isotope X⁺ contains 54 electrons and 78 neutrons.
 - What is the mass number for this element?
 - A) 133
 - B) 132
 - C) 131
 - D) 55E) 53

41. D

36. C 42. B 48. D 59. B 37. B 43. E 49. D 63. C 38. A 44. A 50. B 64. E 39. D 45. D 51. B 65. B 40. C 46. D 52. A 66. A

58. E

67. A

- 8. According to the quantum theory of an atom, in an orbital
 - a. an electron's position cannot be known precisely.

47. E

- b. an electron has no energy.
- c. electrons cannot be found.
- electrons travel around the nucleus on paths of specific radii.
- 13. The set of orbitals that are dumbbell shaped and directed along the *x*, *y*, and *z* axes are called
 - a. d orbitals.
 - b. *p* orbitals.
 - c. f orbitals.
 - d. *s* orbitals.
- 14.A spherical electron cloud surrounding an atomic nucleus would best represent
 - a. an *s* orbital.
 - b. a p_x orbital.
 - c. a combination of p_x and p_y orbitals.
 - d. a combination of an s and a p_x orbital.

15. The major difference between a 1s orbital and a 2s orbital is that

- the 2s orbital can hold more electrons. a.
- b. the 2s orbital has a slightly different shape.
- the 2s orbital is at a higher energy level. c.
- the 1s orbital can have only one electron. d.

16.An orbital that can never exist according to the quantum description of the atom is

- 3*d*. a.
- b. 7s.
- c. 6d.
- 3*f*. d.

18. The number of orientations for the d orbitals is

- 1. a.
- b. 3.
- 5. c.
- d. 7.

19. How many orientations can an s orbital have about the nucleus?

- 1 a.
- b. 2
- 3 c.
- d. 5

20.One main energy level can hold 18 electrons. What is n?

- $+\frac{1}{2}$ a.
- 3 b.
- c. 6
- 18 d.
- 21. Electron occupies the lowest available energy orbital is Hund's rule. a.
 - b. the Aufbau principle.
 - c. Bohr's law.
 - the Pauli exclusion principle. d.
- 22."Orbitals of equal energy are each occupied by one electron before any is occupied by a second electron, and all electrons in singly occupied orbitals must have the same spin" is
 - a. the Pauli exclusion principle.
 - b. the Aufbau principle.
 - the quantum effect. c.
 - d. Hund's rule.

23. Which of the following lists atomic orbitals in the correct order they are filled according to the Aufbau principle?

- a. 1s 2s 2p 3s 4s 3p 3d 4p 5s
- b. 1s 2s 2p 3s 3p 4s 3d 4p 5s
- 1s 2s 2p 3s 3p 4s 4p 3d 4d c.
- 1s 2s 2p 3s 3p 3d 4s 4p 5s d.

Answers	8. A	17. C
	13. B	18. C
4. B	14. A	19. A
5. C	15. C	20. B
6. B	16. D	21. B

- 24.In the ground state, the 3d and 4s orbitals of the chromium atom (atomic number 24) are represented as
 - $3d^6 4s^1$. a.
 - b. $3d^4 4s^2$. $3d^5 4s^1$.
 - c. d. $4s^2 3d^4$.

25. The element with electron configuration $1s^2 2s^2 2p^6 3s^2 3p^2$ is

- Mg (Z = 12). a.
- b. C(Z = 6).
- S(Z = 16).c.
- d. Si (Z = 14).

26. The electron notation for aluminum (atomic number 13) is

- $1s^2 2s^2 2p^3 3s^2 3p^3 3d^1$. a.
- $1s^{2} 2s^{2} 2p^{6} 3s^{2} 2d^{1}.$ $1s^{2} 2s^{2} 2p^{6} 3s^{2} 3p^{1}.$ b.
- c.
- $1s^2 2s^2 2p^9$. d.
- 27. The number of electrons in the highest energy level of the argon atom (atomic number 18) is
 - 10. a.
 - b. 2.
 - c. 6.
 - 8. d.

Problem Use periodic table below to answer the following Os 28. Which element has the following electron configuration: [Ar] $4s^2 3d^{10} 4p^5$?

- 29.Write the noble-gas electron configuration for silicon.
- 30.Draw the orbital diagram for phosphorus.
- 31.Draw the orbital diagram for argon.
- 32. Write the noble-gas electron configuration represented in the orbital diagram below.



33.Argon, krypton, and xenon are

- alkaline earth metals. a.
- b. noble gases.
- c. actinides.
- lanthanides. d.

22. D	27. D	32. [Ne] $3s^2 3p^3$
23. B	28. Br	33. B
24. D	29. [Ne] $3s^2 3p^2$	
25. D	30. X	
26. C	31. X	

Dougherty Valley HS Chemistry Fall Test #1 – Practice Test

- 1. Which color of visible light has the least amount of energy per photon? violet A) B) blue C) green D) yellow E) red 2. The energy levels of the hydrogen atom (and all atoms) are _____, meaning that only certain discrete energy levels are allowed. A) varied B) quantized C) ramp-like continuous D) two of these E) 3. True or false? A packet of energy of electromagnetic radiation is called a electrons. True A) B) False 5. The probability map for an electron is called an orbit A) B) a photon C) an orbital D) an electron configuration none of these E) 6. The maximum number of electrons allowed *in each* of the p orbitals is 2 A) 4 B) C) 8 D) 18 E) none of these 7. A given set of *d* orbitals consists of _ orbital(s). 1 A) 3 B) 5 C) D) 6 8. The maximum electron capacity of an *f* sublevel is 18 A) B) 14 C) 10 D) 6 E) 2 9. A *d* sublevel can hold a maximum of 5 electrons A) B) 10 electrons C) 14 electrons D) 32 electrons energy level is A) 2 6 B) C) 10 D) 0 11. The electron configuration for the sulfur atom is $1s^22s^22p^63s^23p^2$ A) B) $1s^22s^22p^63s^23p^4$ $1s^2 2s^2 2p^6 3s^5$ C) $1s^22s^22p^63s^23p^5$ D)
 - E)

- 13. How many electrons are in the third principal energy level (n = 3) of one atom of Fe?
 - 2 A) 8
 - B)
 - C) 14
 - D) 18
 - none of these E)
- 14. The noble gases contain how many valence electrons?
 - A) 1
 - 7 B)
 - 0 C)
 - D) 8
 - E) none of these
- 15. The maximum number of electrons in the second principal energy level of an atom is
 - 2 A)
 - B) 6
 - 8 C)
 - D) 18
 - E) 32
- 16. Which element has the fewest electrons in its valence shell?
 - A) Cs
 - B) Mg
 - C) Р
 - 0 D)
 - Br E)
- 17. Which one of the following atoms has a partly filled d sublevel?
 - Ca A)
 - Ni B)
 - C) Zn
 - D) As
- E) Ar 19. What is the expected ground-state electron
 - configuration for Te²⁻? $[Kr]5s^25d^{10}5p^4$
 - A) $[Kr]5s^24d^{10}5p^4$
 - B) $[Kr]5s^24d^{10}4f^{14}5p^6$
 - C) $[Kr]5s^24d^{10}5p^6$ D)
 - $[Ar]5s^24d^{10}5p^2$ E)
- 20. The correct electron configuration for Mn is
 - $1s^22s^22p^63s^23p^63d^7$ A)
 - $1s^22s^22p^63s^23p^64s^23d^6$ B)
 - $1s^22s^22p^62d^{10}3s^23p^3$ C)
 - $1s^22s^22p^63s^23p^64s^23d^5$ D)
 - E) none of these
- 21. The electron configuration for manganese is
 - A) [Ar] 3d⁷
 - $1s^22s^22p^63s^13d^6$ B)
 - [Ar] $4s^2 3d^5$ C)
 - $1s^22s^22p^63s^23d^4$ D)
 - E) [Ar] $4s^24p^5$
- 22. Which of the following has the electron configuration $1s^22s^22p^63s^23p^64s^23d^5$?
 - Cr A)
 - B) Ca
 - C) Mn
 - D) Br
 - E) none of these

none of these

10. The number of d orbitals in the second principal

Dougherty Valley HS Chemistry Fall Test #1 – Practice Test

- 23. Which of the following atoms has the electron configuration 1s²2s²2p⁶3s²3p⁶4s²3d¹?
 A) Sc
 - A) ScB) Ca
 - B) (
 - C) Sr D) Ar
 - D) ArE) none of these
- 24. How many unpaired electrons does the element cobalt (Co) have in its lowest energy state?
 - A) 0
 - B) 1
 - C) 2
 - D) 3
 - E)
- 25. Which electron configuration indicates a transitional element?
 - A) $1s^22s^22p^63s^13p^6$
 - B) $1s^22s^22p^63s^23p^64s^23d^3$
 - C) $1s^2 2s^2 2p^5$

7

- D) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$
- E) none of these
- 26. The element with the electron configuration [Kr] $5s^24d^{10}5p^3$ is
 - A) As
 - B) Sb
 - C) Nb
 - D) Pr
 - E) none of these
- 27. How many of the following electron configurations for the species in their ground state are correct?
 I. Ca: 1s²2s²2p⁶3s²3p⁶4s²
 II. Mg: 1s²2s²2p⁶3s¹
 III. V: [Ar] 3s²3d³

IV. As: [Ar] $4s^23d^{10}4p^3$

- V. P: 1s²2s²2p⁶3p⁵
- A) 1
- B) 2
- C) 3
- D) 4
- E) 5
- 30. Consider the following representation of the **one** orbital below. The points represent various electron locations.



Where could an electron be located in the representation above?

- A) Point A
- B) Point B
- C) Point C
- D) Point D
- E) An electron could be located at any of these points.

- 31. What element has the electron configuration $1s^22s^22p^63s^23p^64s^23d^{10}4p^5$?
 - A) Cl
 - A) CI B) Se
 - C) I
 - D) Kr
 - E) Br
- 32. What element has the electron configuration $1s^22s^22p^63s^23p^3$?
 - A) N
 - B) P
 - C) S
 - D) Al
 - E) Cl
- 33. What element has the electron configuration $1s^22s^22p^63s^23p^6$?
 - A) Ar
 - B) Cl
 - C) Kr
 - D) S
 - E) none of these
- What atom below will have the same number of electrons as Fe²⁺
 - A) Cr
 - B) Ni
 - C) Kr
 - D) Ar
 - E) K
- 42. How many f orbitals have the value n = 3?
 - A) 0
 - B) 3
 - C) 5
 - D) 7
 - E) 1
- 46. Which Ion below has an electron configuration of $1s^22s^22p^63s^23p6$
 - A) Ar
 - B) Cl²⁻
 - C) Ne
 - D) S²⁻
 - E) O²⁻

Answer Key

1. E 13. C 24. D 25. B 2. B 14. D B 15. C 26. B 5. C 27. B 16. A 17. B 30. E 6. A 7. C 19. D 31. E 8. B 20. D 32. B 9. B 21. C 33. A 34. A 22. C 10. D 11. B 23. A 42. A 46. D



This practice test is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. **Please time yourself! This practice test should take a maximum of** <u>65 minutes</u> to ensure you are going fast enough to finish the actual Test in class!



- 7. Compared to a Barium ion, which of the following ions would have the same number of total electrons?
 - A) Pb⁴⁺
 - B) Sn²⁺
 - C) I⁻
 - D) Pb²⁺
 - E) Br-





9.	A change involves a change in one or more physical properties, but no change in the	
	fundamental components that make up the	
	substance.	
	A) potential	
	B) mixed	
	C) chemical	
	D) kinetic	
	E) physical	
10.	An atom with 15 protons and 16 neutrons is an	
	atom of	
	A) S	
	B) Rh	
	C) Pd	
	D) Ga	
	E) P	
11.	Which of these is a chemical property?	
	A) Helium is very nonreactive.	
	B) Water has a high specific heat.	
	C) Sodium is a soft, shiny metal.	
	D) Oxygen is a gas.	
	E) Ice melts at 0° C.	
12.	How many protons, electrons, and neutrons,	
	respectively does ¹²⁷ I have?	
	A) 53 74 53	
	B) 53 53 127	
	C) 53,53,127	
	D) 53 127 74	
	F) 74 53 127	
	2) (1,00,12)	
13.	Which of the following statements are true ?	
	I. Models are always wrong unless they are	
	proved by a theory.	
	II. Elements, such as lead, are made of tiny	
	particles that mostly consist of open space.	
	III. The air you breathe is an example of a	
	heterogeneous mixture.	
	IV. Because NH ₃ always contains the same	
	relative numbers of atoms, it will always contain	
	4.6 g of nitrogen for every 1.0 g of hydrogen.	
	A) I, III	
	B) II only	
	C) II, IV	
	D) I, II, IV	
	E) All of the above statements are true.	
14.	A walker travels a distance of 1.4 miles. How	
	many inches did the walker travel?	
	(1 mi = 5280. ft)	
	(1 ft = 12 in)	
	A) 8.9×10^4 in	
	B) 17. in	
	C) 7.4×10^3 in	
	D) 6.2×10^2 in	
	E) 8.6 in	
		1

15	The chemical formula Al_2O_2 indicates
15.	A) six atoms of each element
	B) five atoms of each element
	C) three atoms of aluminum and two atoms of
	oxygen
	D) two atoms of aluminum and three atoms of
	oxygen
	E) None of these is correct.
16.	How many phosphorus atoms are represented by
	one formula unit of calcium phosphate,
	Ca ₃ (PO ₄) ₃ ?
	A) 9
	B) 12
	C) 6
	D) 18
	E) 3
17.	An example of a pure substance is
	A) carbon dioxide
	B) pure water
	C) elements
	D) compounds
	E) all of these
18.	Which of the following is an element?
	A) sugar
	B) helium
	C) air
	D) salt
	E) water
19.	What element has the following electron
	configuration 1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ⁵
	A) Cu
	B) Mn
	C) Mo
	D) Cr
	E) V
20.	How many hydrogen atoms are indicated by the
	formula (NH4)2C8H4O2?
	A) 20
	B) 24
	C) 12
	D) 8
	E) none of these
21.	The iodine-131 nuclide has a half-life of 8.0 days. If you
	originally have a 651-g sample after 2.0 months you

originally have a 651-g sample, after 2.0 months you will have (Ignore significant figures for this problem. Assume one month is 30 days)

- 125 g 3.6 g 56 g A)
- B)
- C)
- D) less than 1 g
- E) 48 g
- 22. The maximum number of electrons allowed in each of the d orbitals is
 - A) 18
 - B) 32
 - 4
 - C) D) 10
 - E) 2

23. Which of the below noble gas electron

- configurations is correct?
- A) [Kr] $4s^23d^{10}4p^5$ B) [Ar] $3s^22d^{10}3p^5$
- C) [Ar] $4s^24d^{10}4p^5$
- D) [Ne] $4s^23d^{10}4p^5$
- E) [Ar] $4s^23d^{10}4p^5$

24. Which of the following is a chemical change?

- A) A damp towel dries.
- B) Peanuts are crushed.
- C) A "tin" can rusts.
- D) Water condenses on a mirror.
- E) At least two of the above (a-d) exhibit a chemical change.

25. The symbol for the element bromine is

- A) Be
- B) Bn
- C) B
- D) Bro
- E) Br

26. An example of a mixture is

- A) purified water
- B) the air in this room
- C) hydrogen fluoride
- D) gold
- E) all of these

27. A homogeneous mixture is also called

A) a pure substance.

- B) an element.
- C) a heterogeneous mixture.
- D) a compound.
- E) a solution.
- An object has a mass of 40.1 g and occupies a volume of 6.61 mL. The density of this object is
 - A) 0.165 g/mL
 - B) 6.07 g/mL
 - C) too low to measure
 - D) 40.1 g/mL
 - E) 265 g/mL

29. Which of the following is a chemical change?

- A) sugar dissolving in water
- B) butter melting
- C) water boiling
- D) paper burning
- E) gasoline evaporating
- 30. A solution of Copper Sulfate is put into **blue flame** and a green color appears. The same solution of Copper was put into a **yellow flame** and there was no color change. Which of the following best explains this phenomena?
 - A) Insufficient amount of energy of the yellow flame
 - B) Error in solution
 - C) Sufficient amount of energy in the yellow flame
 - D) Insufficient amount of energy of the blue flame

- 31. Which of the following involves no chemical change?
 - A) boiling water
 - B) baking a cake
 - C) driving a car
 - D) burning paper
 - E) lighting a match
- 32. A ______ change involves a change in the fundamental components of the substance; a given substance changes into a different substance or substances.
 - A) kinetic
 - B) potential
 - C) chemical
 - D) mixed
 - E) physical
- 33. You take 20.0 mL of water from a graduated cylinder and add it to the beaker of water below. What is the new volume of water in the beaker?



- A) 35 mL
- B) 25.0 mL
- C) 35.0 mL
- D) 40. mL
- E) 40 mL
- 34. Which of the following processes require(s) chemical methods?
 - A) Separating a heterogeneous mixture into pure substances.
 - B) At least two of the above (a-d) require chemical methods.
 - C) Breaking a compound into its constituent elements.
 - D) Separating a homogeneous mixture into pure substances.
 - E) Distilling a saltwater mixture.
- 35. Which of the following processes is a chemical change?
 - A) Liquid nitrogen dumped onto the floor vaporizes at room temperature.
 - B) Dry ice sublimes when left on the demo table in lecture.
 - C) The light on a candle burns until a bell jar is placed over it for a period of time.
 - D) When a few drops of red food coloring are added to a beaker of hot water, the water immediately turns red.
 - E) None of the above processes are chemical changes.

 36. A particular radioactive element has a half-life of 1.20 years. What percent of the original sample is left after 171.4 days? A) 25.4% B) 38.1% C) 23.8% D) 17.0% E) 76.2% 	 44. Which of the following describes a chemical property of gold? A) Gold is an inert (nonreactive) metal. B) Gold is a soft metal. C) Gold is a good conductor of heat and electricity. D) Gold is a yellow metal. E) Gold is a very dense metal.
 37. Which metric prefix is used to designate 1000? A) k B) d C) M D) m E) c 38. The symbol for the element strontium is A) Sm 	 45. A certain isotope X⁺ contains 54 electrons and 78 neutrons. What is the mass number for this element? A) 55 B) 133 C) 53 D) 131 E) 132
 B) S C) Str D) Sr E) St 	 46. The symbol Cs stands for the element A) calcium B) cesium C) cadmium D) curium
 39. Which particle has the smallest mass? A) helium nucleus B) electron C) neutron D) proton 	 E) carbon 47. A sample of a radioactive element decays to 25.1% of its original amount of radioactive nuclides in 15 years. What is the half-life of this radioactive element?
40. How many protons, electrons, and neutrons, respectively, does ¹⁶ O have? A) 8, 18, 16 B) 8, 10, 8 C) 8, 14, 8 D) 8, 18, 8	 A) 92.5 years B) 36. years C) 2.8 years D) 9.2 years E) 7.5 years
 E) 8, 8, 8 41. Perform the following conversion: 5.84 m/s = mi/h (1m = 39.37in; 1mi = 5280ft) A) 218. mi/h B) 276. mi/h 	 48. The symbol for the element zinc is A) Zc B) Zi C) Zin D) Z E) Zn
C) 11.7 mi/h D) 13.1 mi/h E) 0.383 mi/h 42. 5.7 kilogram(s) contains this many grams: A) 0.57 B) 57	 49. How many of the following are pure compounds? sodium, sugar, oxygen, air, iron A) 3 B) 4 C) 2 D) 5 E) 1
C) 5.7×10^2 D) 5.7×10^{-3} E) 5.7×10^3	50. The Br-82 nucleus has a half-life of about 1.0 x 10 ³ minutes. If you wanted 3.3 g of Br-82 and the delivery time was three
 43. The measurement 8.2 × 10³ g also could be written as A) 8.2 dg B) 8.2 g C) 8.2 kg D) 8.2 mg 	 A) 9.2 g B) 85 g C) 66 g D) 3.3 g E) 4.4 g
E) 8.2 pg	 51. Which of the following represents the correct noble gas configuration of the element Mercury? A) [Xe]6s²5d¹⁰ B) [Xe]6s²4f¹⁴d¹⁰ C) [Rn]6s²4f¹⁴5d¹⁰ D) [Xe]6s²4f¹⁴5d¹⁰

52.	How	w many of the following did Dalton not
	disc	uss in his atomic theory?
	isoto	opes
	ions	
	prot	ons
	elect	trons
	neut	rons
	A)	5
	B)	1
	C)	4
	D)	2
	E)	3
53.	The	symbol Ga stands for the element
	A)	gold
	B)	gadolinium

- C) germanium D) gallium
- none of these E)

Answer Key

54. The state of matter for an object that has neither definite shape nor definite volume is

- A) mixed
- B) gaseous
- C) elemental
- D) solid
- E) liquid
- 55. The element curium (Z = 242, A = 96) can be produced by positive-ion bombardment when an alpha particle collides with which of the following nuclei? Recall that a neutron is also a product of this bombardment.
 - ²⁴¹₉₅Am A)
 - B) $^{239}_{94}{\rm Pu}$
 - ²³⁹₉₂U C)
 - D)
 - $^{241}_{94}$ Pu
 - ²⁴⁹₉₈Cf E)

1. A	20. C	39. B
2. E	21. B	40. E
3. C	22. E	41. D
4. D	23. E	42. E
5. B	24. C	43. C
6. D	25. E	44. A
7. C	26. B	45. B
8. D	27. E	46. B
9. E	28. B	47. E
10. E	29. D	48. E
11. A	30. A	49. E
12. C	31. A	50. C
13. C	32. C	51. D
14. A	33. A	52. A
15. D	34. C	53. D
16. E	35. C	54. B
17. E	36. E	55. B
18. B	37. A	
19. B	38. D	

Total Time Used: /65min	Score: /55 Qs	% Correct %	Types of Qs or Topics Missed:
	Study Plan:		

Review Topics and One Pager Instructions on back of this paper. Do the One Pager on this side of the page. Period: Seat#:



Name:

Dougherty Valley HS Chemistry Chapter #4 – Review Topics and One Pager

This is a general list of some of the topics we have covered this chapter. These are suggested study topics, <u>not</u> a definitive list. You can/will be assessed on not just whether you have memorized the material, but also if you can apply the information to a new scenario/situation/context/example. Remember – there is a difference between "knowing" something and truly "understanding" something – memorization vs applying!

- Periodic Table Structure
- Classes of elements
- Group names
- Valence electrons

- Atomic Radius
- Ionic Radius
- Ionization Energy
- Electronegativity

- Electron affinity
- Reactivity
- Shielding
- Effective Nuclear Charge

One Pager Instructions

A one-pager is a written and graphic interpretation of what you've learned presented on a single sheet of paper. In this case, you will demonstrate that you have successfully practiced strategies commonly used by effective learners. The one-pager will help showcase your thoughts and will provide a reference for later review or further study of the topics.

Guidelines:

 U (y Fi W U 	 se 8.5 x 11" unlined paper ou will use the front of this paper). Il the entire paper Iriting must be in ink, no pencil. se color for illustrations. 	Include all required info (arrange it on page any Must show higher level PROCESSING of the info regurgitating every fact	rmati way y THINI rmati you lo	tionNeeds to show a high level of effort, detail, thought, and care. This is not something you scribble out during brunch before class starts!Idearned.Must be clear, easy to read, understandable	
Rec	quired Information:				
	Chapter number and title			Visual representations of the important aspects of the chapter	
	Must address all the Review Topics above	annlicable)		Two higher level questions about the concepts INCLUDING answers. These are not <i>calculations</i> to solve.	
	List of key concepts/topics			Two annotated/explained "representative practice problems" for any topics related to math. If no math in the chapter then does not need to be included.	
	Five most important vocabulary words/terr Explanations of words or ideas that corresp	ns ond to the chapter		A 10 sentence paragraph that summarizes and connects the	
	A "warning" or "tips" section			information together. Will be done below on this side of th paper.	

Ten Sentence Summary - Pretend you are writing a little miniature textbook selection for this chapter!

Review Topics and One Pager Instructions on back of this paper. Do the One Pager on this side of the page. Period: Seat#:

Name:

Dougherty Valley HS Chemistry Chapter #5 – Review Topics and One Pager

This is a general list of some of the topics we have covered this chapter. These are suggested study topics, <u>not</u> a definitive list. You can/will be assessed on not just whether you have memorized the material, but also if you can apply the information to a new scenario/situation/context/example. Remember – there is a difference between "knowing" something and truly "understanding" something – memorization vs applying!

- Types of Bonds
- Properties of Bonds
- Naming ionic compounds
- Naming covalent molecules
- Writing neutral ionic formulas with crossing over
 Writing covalent formulas

double bonds, triple bonds

Lewis structures of single bonds,

- Lewis structures of "weird things" that break the rules
- VSPER molecular geometry
- Polarity
- Intermolecular forces

One Pager Instructions

A one-pager is a written and graphic interpretation of what you've learned presented on a single sheet of paper. In this case, you will demonstrate that you have successfully practiced strategies commonly used by effective learners. The one-pager will help showcase your thoughts and will provide a reference for later review or further study of the topics.

 Use 8.5 x 11" unlined paper (you will use the front of this paper). Fill the entire paper Must show higher level THINKING and PROCESSING of the information, not just regurgitating every fact you learned. Must address all the Review Topics above Key equations (with names of equations if applicable). List of key concepts/topics Five most important vocabulary words/terms Explanations of words or ideas that correspond to the chapter A "warning" or "tips" section Include all required information (arrange it on page any way you choose). Must show higher level THINKING and PROCESSING of the information, not just regurgitating every fact you learned. Needs to show a high level of effort, detail, thought, and care. This is not something you scribble out during brunch before class starts! Must address all the Review Topics above Two higher level questions about the concepts INCLUDING answers. These are not <i>calculations</i> to solve. Two annotated/explained "representative practice problems" for any topics related to math. If no math in the chapter then does not need to be included. A "warning" or "tips" section 	Gu	<u>idelines:</u>					
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		A "warning" or "tips" section			paper.	-	

Ten Sentence Summary - Pretend you are writing a little miniature textbook selection for this chapter!

Dougherty Valley HS Chemistry Chapter #6 – Review Topics and One Pager Instructions on back of this paper. Do the One Pager on this side of the page.



Name:

Period:

This is a general list of some of the topics we have covered this chapter. These are suggested study topics, not a definitive list. You can/will be assessed on not just whether you have memorized the material, but also if you can apply the information to a new scenario/situation/context/example. Remember – there is a difference between "knowing" something and truly "understanding" something - memorization vs applying!

- Signs of a reaction .
- Solubility
- **Balancing Equations**
- Types of Reactions
- **Predicting Products**
- Activity Series
- Net Ionic Reactions
- Molar Mass
- Molar Conversions
- (Please note this list doesn't look very big but actually covers soooo much information!)

One Pager Instructions

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Dougherty Valley HS Chemistry Study Guide Test #2



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Periodic Table

- Know the names of the groups on the periodic table
 - Alkali metals, alkaline earth metals, transition metals, semi-metals(metalloids), other non-metals, halogens, noble gases, rare earth metals
- Know how to use the periodic table to find the number of valence electrons for s and p block
- Know how to use the periodic table to find the charge each element likes to make
- Define the following trends
 - Atomic radius
 - o Electronegativity
 - Ionization energy
 - Electron affinity
 - o Ionic radius
 - Reactivity
- Describe how the trends above change as you go up/down left/right on the periodic table
- Explain WHY the trends above change as you go up/down left/right on the periodic table
 - Make sure you are including terms such as greater effective nuclear charge, shielding, energy levels, etc – BUT make sure you are also explaining what those mean in terms of distance from nucleus and the attraction strength between nucleus and valence electrons
 - Make sure you are thinking about the difference between an ok answer, a better answer, and the BEST answer!
- Be able to rank elements from small to big, or big to small for the trends listed above.
 - Do not worry about exceptions for simple ranking problems

Bonding

- Types of bonds and properties of each type
 - o lonic transfers electrons, covalent shares, metallic delocalized free flowing sea of e-
 - Draw and explain the "sea of electrons" model regarding metallic bonding.
 - Explain why these delocalized electrons allow for conductivity
 - Describe the difference between properties of ionic, covalent, metallic compounds
 - Identify ionic and covalent compounds based on what class of elements they are made of? Metal-metal, metal-nonmetal, nonmetal-nonmetal
 - + Be able to tell if particular bonds between elements are ionic or covalent using electronegativity differences (numbers will be provided)
- Naming and Writing Formulas
 - o lonic must be neutral, crossing over
 - Covalent prefixes
- Lewis Structures
 - Know the octet rule. Be able to explain some of the exceptions to the rule. Which elements have an exception to the octet rule? Understand that anything can break the rule if it has to.
 - o Draw Lewis Structures of single bonds, double bonds, triple bonds, ions
 - o Draw Lewis Structures of "weird" molecules that break the "rules"

- VSEPR
 - o Identify molecular geometry (memorized from chart)
 - Identify bond angles (memorized from chart)
 - o Identify electron geometry and hybridization when provided with a VSPER chart
- Polarity
 - o Identify if a bond or molecule is polar or nonpolar
 - What does it mean to be a polar bond?
 - Draw the polarity of a molecule using arrows or partial positive/negative symbols

Reactions

- Signs of a reaction
 - Basic vocabulary
 - o Reactant
 - Product
 - Word equations
 - Skeleton equations
 - Conservation of mass
- Balancing equations
- Identify the types of chemical reactions
 - o Synthesis
 - Combustions
 - o Decomposition
 - Single Replacement
 - Double Replacement
- Predict products
 - Use the identified type of reaction to follow the pattern and predict the products
 - DON'T STEAL SUBSCRIPTS!!!!
 - Make valid neutral formulas by crossing over FROM SCRATCH
 - Careful about diatomics!
 - Balance when done to fix any conservation of mass issues
 - Use Activity Series to see if single replacement reactions actually happen
 - Use Solubility Chart to see what phase each compound is in for single and double replacement reactions
- Net ionic equations
 - Be able to "put it all together"
 - Names of reactants → formulas → identify type of reaction → predict the products → balance → identify phases using solubility chart → write complete ionic equation showing the aqueous compounds broken apart → identify spectator ions → write net ionic equation with spectator ions gone



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Start with the optional worksheets you already have!

- 1) Worksheet #9* from Chapter 4 packet
- 2) Worksheet #16* from Chapter 5 packet
- 3) Worksheet #5* from Chapter 6 packet

Answer the following questions:

- 4) Define: reactivity, atomic radius, electronegativity, ionization energy, electron affinity
- 5) Describe the pattern going up/down left/right for each of the trends above
- 6) Explain WHY each trend happens the way it does up/down left/right. Give the BEST answer not just an ok one.
- 7) Where are the most active metals located?
- 8) Where are the most active non-metals located?
- 9) Is a negative ion is larger or smaller than its parent atom?
- 10) Is a positive ion is larger or smaller than its parent atom?
- 11) Where is the highest electronegativity found?
- 12) Where is the lowest electronegativity found?
- 13) Elements of Group 1A are called
- **14)** Elements of Group 2A are called
- 15) Elements in the middle of the periodic table are called
- **16)** Group 7A elements are called
- 17) Group 8A elements are called
- 18) From left to right across the periodic table, do elements go from (metals to nonmetals) or (nonmetals to metals)
- 19) The most active element in Group 7A is
- 20) What orbitals are filling across the Transition Elements?
- 21) Elements within a group have the same number of what?
- 22) Are the majority of elements in the periodic table metals or non metals
- 23) Elements in the periodic table are arranged according to their what?
- 24) For each set of atoms, rank the atoms from smallest to largest atomic radius.
 - a) Li, C, F
 - b) Li, Na, K
 - c) Ge, P, O
 - d) C, N, Al
 - e) Al, Cl, Cu
- 25) For each set of atoms, rank them from lowest to highest ionization energy.
 - a) Mg, Si, S
 - b) Mg, Ca, Ba
 - c) F, Cl, Br
 - d) Ba, Cu, Ne
 - e) Si, P, He

26) For each set of atoms, rank them from lowest to highest electronegativity.

- a) Li, C, N
- b) Ne, C, O
- c) Si, P, O
- d) Mg, K, P
- e) S, F, He

27) Circle the correct element.

<u>dir cie une correcte ciementa</u>					
Si	S	metal			
Р	As	smallest ionization energy			
Са	Sc	largest atomic mass			
Cl	Ar	member of the halogen family			
Si	Р	greatest electronegativity			
Al	Si	largest atomic radius			
Nb	Та	largest atomic number			
Ι	Хе	member of noble gases			
Ge	Sn	4 energy levels			
Be	В	member of alkali metals			
Se	Br	6 valence electrons			
Li	Na	nonmetal			
Tl	Pb	member of transition metals			
Mg	Al	electron config. ending in s ² p ¹			
Bi	Ро	metalloid			
С	Ν	gas at room temperature			
Sc	Ti	electron config. ending in s ² d ²			
	Si P Ca Cl Si Al Nb I Ge Be Li Tl Mg Bi C Sc	Si S P As Ca Sc Cl Ar Si P Al Si Nb Ta I Xe Ge Sn Be B Se Br Li Na Tl Pb Mg Al Bi Po C N Sc Ti			

Identify type of bond and then either write the name or write the formula:

28) Sodium iodide	33) (NH ₄) ₂ O	38) Phosphorus pentachloride
29) NH₄OH	34) N ₂ O ₂	39) dioxygen difloride
30) carbon tetrahydride	35) SO ₂	40) strontium borate
31) N ₂ O ₄	36) Mg ₃ (PO ₃) ₂	41) sulfur trioxide
32) C ₂ H ₄ O ₂	37) P ₄ O ₁₀	42) sodium sulfate

S-12*

Answer the following questions about bonding:

- 43) How are ionic bonds, covalent bonds, and metallic bonds different?
- **44)** Give one examples of a compound for each of the above bonds.
- 45) If you have a compound with a high electronegativity difference what type of bond is it?
- 46) What is the strongest intermolecular bond?
- 47) What type of intermolecular bond does water have?
- 48) What type of bond holds Iron together?
- **49)** List the following intermolecular forces/structures from <u>Strongest to Weakest</u>:
- Hydrogen Bonding, Metallic Bonding, London Dispersion, Ionic Lattices, Dipole-Dipole, Network Covalent
- **50)** Draw Lewis Structures of 3 water molecules next to each other and label the hydrogen bonds with dashed lines.
- **51)** Put the compounds below in order of intermolecular forces.

Name	Boiling point
Dicarbon hexahydride	-89°C
Diamonds (carbon)	4827°C
Sodium chloride	1,465°C
Dihydrogen monoxide	100°C

52) Which of the above is a network covalent bond? Which is a ionic lattice? Which is a hydrogen Dipole Dipole?53) How many valance electrons are there in each of the elements and compounds below?

	,		•		
a.	Са	c.	Se	e.	NF_3
b.	Р	d.	NH ₃	f.	H_2S

Draw the lewis structure for each of the compounds below and show if they are ionic or covalent using the electronegativity values from your notes/worksheets:

54) LiF	57) CH₃OH	60) CH ₄
55) MgO	58) NH₃	
56) CH ₄	59) H ₂ O	

Draw the Lewis Structures of the following:

61) CH ₂ Cl ₂	63) CH₃OH	65) NO₃ ⁻
62) SO ₄ ²⁻	64) SO ₂	66) NH4 ⁺

Identify the type of reaction and balance. For single and double replacements, write the net ionic equation.

67) ___Cu(s) + ___O₂(g) \Rightarrow ___CuO(s) 68) ___H₂O \Rightarrow ___H₂(g) + ___O₂(g) 69) ___Fe(s) + ___H₂O(g) \Rightarrow ___H₂(g) + ___Fe₃O₄ 70) ___AsCl₃(aq) + ___H₂S(aq) \Rightarrow ___As₂S₃(s) + ___HCl(aq) 71) ___CuSO₄ • 5H₂O(s) \Rightarrow ___CuSO₄(s) + ___H₂O(g) 72) ___Fe₂O₃(s) + ___H₂(g) \Rightarrow ___Fe(s) + ___H₂O(l) 73) __CaCO₃(s) \Rightarrow __CaO(s) + __CO₂(g) 74) ___Fe(s) + ___S₈(s) \Rightarrow ___FeS(s) 75) ___H₂S(aq) + ___KOH(aq) \Rightarrow __HOH(l) + ___K₂S(aq) 76) ___NaCl(l) \Rightarrow __Na(l) + ___Cl₂(g) 77) ___Al(s) + ___H₂SO₄(aq) \Rightarrow ___H₂(g) + ___Al₂(SO₄)₃(aq) 78) ___H₃PO₄(aq) + ___NH₄OH(aq) \Rightarrow __HOH(l) + ___(NH₄)₃PO₄(aq) 79) __C₃H₈(g) + ___O₂(g) \Rightarrow __CO₂(g) + ___H₂O(g) 80) ___Al(s) + ___O₂(g) \Rightarrow ___CO₂(g) + ___H₂O(g)

Identify the type, predict the products, balance. For any single and double replacement reactions use your solubility rules to do the net ionic equation as well.

82) Mg + O₂ --->
83) CH₄ + O₂ --->
84) AgNO₃ + NaCl --->
85) HgO --->
86) Cu + AgNO₃ --->
86) Cu + AgNO₃ --->
87) Zn + HCl --->
88) FeS + HCl --->
89) MgCl₂ --->
90) C₂H₆ + O₂ --->
91) K + Cl₂ --->
Dougherty Valley HS Chemistry Fall Test #2 - Practice Test



This practice test is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. Please time yourself! This part of the practice test should take a maximum of 19 minutes to ensure you are going fast enough to finish the actual Test in class!

- 1. The elements chlorine and iodine have similar chemical properties because they
 - A) are both metals
 - are in the same chemical period B)
 - C) have the same number of electrons in their outer energy levels
 - D) have the same number of stable isotopes
 - none of these E)
- 2. The noble gases contain how many valence electrons?
 - A) 1
 - B) 7
 - C) 0
 - D) 8
 - E) none of these
- 3. The # of electrons in the *third sublevel* of an iron atom is A) 3
 - B) 6
 - C) 8
 - D) 26
 - E) 56
- 4. Which element has the fewest electrons in its valence shell? A) Cs
 - Mg B)
 - C) Р
 - D) 0
 - E) Br
- 5. The element with atomic number 113 would be a member of the halogens A)
 - B) the transition elements
 - the noble gases C)
 - D) the Group 13 elements
 - E) none of these
- 6. Rank the following from smallest to largest atomic radius.
 - O, Zn, Ca, Ba A)
 - O, Ca, Zn, Ba B)
 - C) Ba, Ca, Zn, O
 - O, Zn, Ba, Ca D)
 - Ca, Ba, Zn, O E)
- 7. Which of the following has the smallest atomic radius?
 - Ν A)
 - B) F
 - C) Br
 - D) Cl
 - E) S

- 8. Which of the following has the highest ionization energy?
 - A) Al
 - B) Si
 - C) Р
 - D) As
 - Sb E)
- 9. Which of the following exhibits the correct orders for both atomic radius and ionization energy, respectively?
 - S, O, F, and F, O, S A)
 - B) F, S, O, and O, S, F
 - C) S, F, O, and S, F, O D)
 - F, O, S, and S, O, F
 - E) none of these
- 10. Order S, Cl, and F in terms of increasing ionization energy.
 - A) S, Cl, F
 - Cl, F, S B)
 - F, S, Cl C)
 - F, Cl, S D)
 - S, F, Cl E)
- 11. Order S, Cl, and F in terms of increasing atomic radii.
 - S. Cl. F A)
 - B) Cl, F, S
 - C) F, S, Cl
 - D) F, Cl, S
 - E) S, F, Cl
- 12. Order the following ions from smallest to largest atomic size.
 - As3-, Se2-, Sr2+, Rb+, Br-
 - A) $As^{3-} < Se^{2-} < Br^{-} < Rb^{+} < Sr^{2+}$
 - $Sr^{2+} < Rb^+ < As^{3-} < Se^{2-} < Br^-$ B)
 - $As^{3-}\,{<}\,Se^{2-}\,{<}\,Br^{-}\,{<}\,Sr^{2+}\,{<}\,Rb^{+}$ C)
 - D) $Rb^{\scriptscriptstyle +} < Br^{\scriptscriptstyle -} < Sr^{2 \scriptscriptstyle +} < As^{3 \scriptscriptstyle -} < Se^{2 \scriptscriptstyle -}$
 - $Sr^{2+} < Rb^+ < Br^- < Se^{2-} < As^{3-}$ E)
- 13. A phosphorus atom needs to gain electrons to achieve a noble gas configuration.
 - A) 2
 - B) 3
 - C) 4
 - D) 5
 - E) 6

check answers with key on the back

Answer Key

- 1. C 2. D
- 3. B
- 4. A
- 5. D
- 6. A 7. B
- 8. C
- 9. D
- 10. A
- 11. D
- 12. E
- 13. B

Has not been checked! Please tell me if you see typos!!!

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- 1. When the following equation is balanced, what is the sum 3. In the balanced molecular equation for the neutralization of of the coefficients? sodium hydroxide with sulfuric acid, the products are: $Al_2(SO_4)_3 + Ca(OH)_2 \rightarrow Al(OH)_3 + CaSO_4$ A) $NaSO_4 + H_2O$ B) $NaSO_3 + 2H_2O$ A) Δ $2NaSO_4 + H_2O$ B) 9 C) $Na_2S + 2H_2O$ C) 8 D) $Na_2SO_4 + 2H_2O$ E) D) 3 10 E) 4. Roundup, an herbicide manufactured by Monsanto, has the formula C₃H₈NO₅P. How many moles of molecules are 2. In the Lewis structure for SF₆, the central sulfur atom shares there in a 349.7-g sample of Roundup? _ electrons. A) 0.4835 4 A) B) 2.532 8 B) 10 C) 2.068 C)
 - D) 12

 - none of the above, because SF₆ is an ionic compound E)

- - D) 19.43
 - E) none of these

- How many of the following molecules possess dipole moments? BH₃, CH₄, PCl₅, H₂O, HF, H₂
 - A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5
- 6. In the Lewis structure for elemental nitrogen there is (are)
 - A) a single bond between the nitrogens.
 - B) a double bond between the nitrogens.
 - C) a triple bond between the nitrogens.
 - D) three unpaired electrons.
 - E) none of the above.
 - 7. What type of reaction is below $2HCl \rightarrow H_2 + Cl_2$ A) synthesis
 - B) Decompositon
 - C) Single Replacement
 - D) Double Replacement
 - E) Combustion
- 8. Balanced chemical equations imply which of the following?
 - A) Numbers of molecules are conserved in chemical change.
 - B) Numbers of atoms are conserved in chemical change.
 - C) Volume is conserved in chemical change.
 - D) a and b
 - E) b and c
- 9. When phosphorus and chlorine atoms combine to form a molecule of PCl₃, 6 electrons will be
 - A) Shared equally
 - B) shared unequally
 - C) Gained
 - D) Lost
 - E) evenly distributed
- 10. Atoms with very similar electronegativity values are expected to form
 - A) no bonds.
 - B) covalent bonds.
 - C) triple bonds.
 - D) ionic bonds.
 - E) none of these
- 11. Which of the following contains only one unshared pair of e-?
 - A) NH₃
 - B) H₂O
 - C) CH₄
 - D) NaCl
 - E) BeF₃
- 12. A reaction occurs between sodium carbonate and hydrochloric acid producing sodium chloride, carbon dioxide, and water. The correct set of coefficients, respectively, for the balanced reaction is:
 - A) 3 6 6 3 4
 - B) 8 6 5 10 5
 - C) 5 10 10 5 5
 - D) 1 2 2 1 1
 - E) none of these

- 13. What is the correct chemical formula for cupric oxide?
 - A) Cu_2O_3
 - B) Cu₃O
 - C) CuO₃
 - D) Cu_3O_2
 - E) CuO
 - 14. Which of the following molecules contains a central atom with sp² hybridization?



- 15. Which of the following molecules is non-polar overall?
 - A) SF4
 - B) SF₂
 - C) CCl₄
 - D) H₂S
 - E) OCl₂
- 16. The hybridization of the central atom in XeF5⁺ is:
 - A) sp
 - B) sp²
 - C) sp^3
 - D) dsp³
 - E) $sp^{3}d^{2}$

17. Which of the following Lewis structures best describes BF₃?



- 18. What type of reaction is below $Na_2CO_3 + H_2SO_4 ---> Na_2SO_4 + H_2CO_3$
 - A) synthesis
 - B) Decompositon
 - C) Single Replacement
 - D) Double Replacement
 - E) Combustion

Use the following to answer question 19: Using the following electronegativity values

ig me i	onowing (electronegativity value	28
С	2.5	Cl	3.2
Н	2.2	Ν	3.0
		0	3.4

Then select from the following group the molecule that fits the given statement:

a) CH₃CHO

b)	CO_2
c)	CH ₃ C
1	A 11

- d) C₂H₆ e) none
- 19. This molecule shows the smallest number of lone pairs in its Lewis structure.
 - A) CH₃CHO
 - B) CO₂
 - C) CH₃Cl
 - D) C₂H₆
 - E) none

- 20. Which of the following has a dipole moment?
 - A) CO₂
 - B) CO²⁻
 - C) NH⁺4
 - D) PF3
 - E) two of them do
- 21. For which compound does 0.256 mole weigh 12.8 g? A) $C_2H_4\Theta$
 - $\frac{A}{B}$ $\frac{CO_2}{CO_2}$
 - C) CH₃Cl
 - $D) C_2H_6$
 - E) none of these
- 22. What type of reaction is below $2H_2 + O_2 -> 2H_2O$
 - A) synthesis
 - B) Decompositon
 - C) Single Replacement
 - D) Double Replacement
 - E) Combustion
- 23. What is the molar mass of ethanol (C_2H_5OH) ?
 - A) 45.06
 - B) 42.04
 - C) 46.07
 - D) 34.06
 - E) 62.07
- 24. What is the coefficient for water when the following equation is balanced?
 - $As(OH)_3(s) + H_2SO_4(aq) \rightarrow As_2(SO_4)_3(aq) + H_2O(1)$
 - A) 1
 - B) 2
 - C) 4
 - D) 6E) 12
 - .) 12
- 25. Which of the following molecules has no dipole moment?
 - A) CO₂
 - B) NH₃
 - C) H₂O
 - D) all
 - E) none
- 26. How many grams are in a 6.980-mol sample of sodium hydroxide?
 - A) 40.00 g
 - B) 279.2 g
 - C) 167.5 g
 - D) 5.730 g
 - E) 0.1745 g

Use the following to answer question 27: Aqueous solutions of barium chloride and silver nitrate are

mixed to form solid silver chloride and aqueous barium nitrate.

- 27. The balanced molecular equation contains which one of the following terms?
 - A) AgCl(s)
 - B) 2AgCl(s)
 - C) 2Ba(NO₃)₂
 - D) BaNO₃
 - E) 3AgCl(s)

28. What is the coefficient for oxygen when the following equation is balanced?

 $NH_3(g) + O_2(g) \rightarrow NO_2(g) +$

- $H_2O(g)$ A) 3
- B) 6
- C) 7
- D) 12
- E) 14
- 29. In the reaction between magnesium and sulfur, the magnesium atoms
 - A) become anions.
 - B) become cations.
 - C) become part of polyatomic ions.
 - D) share electrons with sulfur.
- 30. Based on electronegativity differences, which of the following is most likely to be ionic?
 - A) BaF₂
 - B) Cl₂
 - C) NH₃
 - D) NO₃
 - E) CH₄
- 31. Which of the following cannot exceed the octet rule?
 - A) N
 - B) S
 - C) P
 - D) I
 - E) All of the atoms (a-d) can exceed the octet rule.
- 32. The electron pair in a C-F bond could be considered
 - A) closer to C because carbon has a larger radius and thus exerts greater control over the shared electron pair.
 - B) closer to F because fluorine has a higher electronegativity than carbon.
 - C) closer to C because carbon has a lower electronegativity than fluorine.
 - D) an inadequate model since the bond is ionic.
 - E) centrally located directly between the C and F.
 - 33. Choose the compound with the most ionic bond.
 - A) LiCl
 - B) KF
 - C) NaCl
 - D) LiF
 - E) KCl
 - 34. Phosphoric acid can be prepared by reaction of sulfuric acid with "phosphate rock" according to the equation:

$$Ca_3(PO_4)_2 + 3H_2SO_4 \rightarrow 3CaSO_4 + 2H_3PO_4$$

What is the molar mass of Ca₃(PO₄)₂?

- A) 310.18 g / mol
- B) 87.05 g/mol
- C) 278.18 g / mol
- D) 215.21 g / mol
- E) 166.02 g / mol

35. Which contains the highest % by mass of hydrogen?

- A) HCl
- B) H₂O
- C) H₂SO₄
- D) H₂S
- E) HF

- 36. What type of reaction is below $C_2H_5OH + 3O_2 --> 2CO_2 + 3H_2O$
 - A) synthesis
 - B) Decompositon
 - C) Single Replacement
 - D) Double Replacement
 - E) Combustion
- 37. What type of reaction is below
 - $2Al + 3Pb(NO_3)_2 ---> 3Pb + 2Al(NO_3)_3$
 - A) synthesis
 - B) Decompositon
 - C) Single Replacement
 - D) Double Replacement
 - E) Combustion
- 38. The ability to conduct electricity in the solid state is a characteristic of metallic bonding. This characteristic is *best* explained by the presence of
 - A) mobile protons
 - B) high electronegativities
 - C) mobile electrons
 - D) high ionization energies
 - E) immobile protons
- 39. What is the sum of the coefficients of the following equation when it is balanced using smallest whole number integers?
 - $NaNH_2 + NaNO_3 \rightarrow NaN_3 + NaOH + NH_3$
 - A) 5
 - B) 6
 - C) 7
 - D) 8
 - E) 9
- In balancing an equation, we change the ______ to make the number of atoms on each side of the equation balance.
 - A) formulas of compounds in the reactants
 - B) coefficients of compounds
 - C) formulas of compounds in the products
 - D) subscripts of compounds
 - E) none of these

Use the following to answer questions 41-46: Select the correct molecular structure for the given species from the choices below:

- 41. BeF3⁻
 - A) a) pyramidal
 - B) b) none of these
 - C) c) octahedral
 - D) d) trigonal planar
 - E) e) bent

42. IF₄⁻

- A) pyramidal
- B) tetrahedral
- C) square planar
- D) octahedral
- E) none of these

- 43. XeF4
 - A) pyramidal
 - tetrahedral B)
 - square planar C)
 - octahedral D)
 - E) none of these
- 44. NI3
 - pyramidal A)
 - B) tetrahedral
 - C) square planar
 - D) octahedral
 - E) none of these
- 45. BeCl₂
 - A) linear
 - B) trigonal planar
 - C) tetrahedral
 - D) bent
 - E) none of these
 - 46. SiH4
 - A) pyramidal
 - B) tetrahedral
 - C) square planar
 - D) octahedral
 - E) none of these
 - 47. Which of the following groups contains no ionic compounds? HCN, NO₂, Ca(NO₃)₂ A)
 - PCl₅, LiBr, Zn(OH)₂ B)
 - KOH, CCl₄, SF₄ C)
 - D) NaH, CaF₂, NaNH₂
 - CH₂O, H₂S, NH₃ E)
 - 48. Which of the following are *true* concerning ionic bonding?
 - Ionic bonding occurs between a metal, which has a high A) affinity for electrons, and a nonmetal, which loses electrons relatively easy.
 - CaCl₂ forms because Ca²⁺ is always a more stable species B) than the calcium atom alone.
 - C) Compounds with ionic bonds tend to have low melting points.
 - The electronegativity difference between the bonding D) atoms of ionic compounds is small since the electrons are not shared but rather held together by electrostatic forces.
 - E) All of the above statements are false.
 - 49. Give (in order) the correct coefficients to balance the following: $H_2SnCl_6 + H_2S \rightarrow SnS_2 + HCl$
 - 1, 2, 1, 6 A)
 - 1, 2, 2, 2 B)
 - C) 1, 1, 1, 6
 - D) 6, 2, 1, 1
 - 2, 4, 2, 6 E)
- 50. When electrons in a molecule are not found between a pair of atoms but move throughout the molecule, this is called
 - ionic bonding. A)
 - covalent bonding. B)
 - polar covalent bonding. C)
 - D) delocalization of the electrons.
 - E) a dipole moment.

- 51. The forces of attraction that hold a diamond together are called
 - electrovalent A)
 - B) ionic
 - C) network covalent
 - D) London dispersion
 - E) hydrogen
- 52. Atoms having greatly differing electronegativities are expected to form:
 - A) no bonds
 - B) polar covalent bonds
 - C) nonpolar covalent bonds
 - D) ionic bonds
 - E) covalent bonds
- 53. Which of the following bonds would be the most polar without being considered ionic?
 - A) Mg-O
 - B) C-0
 - C) 0-0
 - Si-O D)
 - E) N-O
- 54. How many atoms of hydrogen are present in 4.11 g of water?
 - A) 1.37×10^{23}
 - B) 1.23×10^{24}
 - C) 4.95×10^{24} D) 2.75×10^{23}
 - 0.456
 - E)
- 55. Which atoms are *most* likely to form covalent bonds?
 - non-metal atoms that share protons A)
 - non-metal atoms that share electrons B)
 - C) metal atoms that share protons
 - D) metal atoms that share electrons
 - E) metal and non-metals atoms sharing electrons
- 56. Which of the following bonds is least polar?
 - С—О A)
 - Н—С B)
 - S-Cl C)
 - D) Br—Br
 - E) They are all nonpolar.
- 57. An element with an electronegativity of 0.9 bonds with an element with an electronegativity of 3.1. Which of the following phrases best describes the bond between these elements?
 - A) mostly covalent in character and formed between a metal and a non-metal
 - B) Mostly covalent in character and formed between two non-metals
 - Mostly ionic in character and formed between a metal and C) a non-metal
 - D) Mostly ionic in character and formed between two non-metals
 - Mostly metallic in character and formed between two E) metals
- 58. Determine the coefficient for O₂ when the following equation is balanced in standard form (smallest whole number integers)

 $C_4H_{10}(g) + O_2(g) \rightarrow CO_2(g) +$

- $H_2O(g)$
- A) 4
- B) 8
- C) 10
- D) 13
- E) 20

Answer Kev	19. D	40. B
0	20. E	41. D
1. B	21. C	42. C
2. D	22. A	43. C
3. E	23. C	44. A
4. C	24. D	45. A
5. B	25. A	46. B
6. C	26. B	47. E
7. B	27. B	48. E
8. B	28. C	49. A
9. B	29. B	50. D
10. B	30. A	51. C
11. A	31. E	52. D
12. D	32. B	53. D
13. E	33. B	54. D
14. B	34. A	55. B
15. C	35. B	56. D
16. E	36. E	57. C
17. A	37. C	58. D
18. D	38. C	
	39. E	

Has not been checked! Please tell me if you see typos!!!

 Dougherty Valley HS Chemistry
 Review Topics and One Pager Instructions on back of

 Chapter #7 – Review Topics and One Pager
 Review Topics and One Pager on this side of the page.



Name:

Period:

Dougherty Valley HS Chemistry Chapter #7 – Review Topics and One Pager

This is a general list of some of the topics we have covered this chapter. These are suggested study topics, not a definitive list. You can/will be assessed on not just whether you have memorized the material, but also if you can apply the information to a new scenario/situation/context/example. Remember - there is a difference between "knowing" something and truly "understanding" something – memorization vs applying!

- Calculating Molar Mass •
- Mole Ratios ٠
- **Real Life Stoichiometry Problems**

- •

- Molar Conversions
- Stoichiometry Problems •
- Yields

One Pager Instructions

A one-pager is a written and graphic interpretation of what you've learned presented on a single sheet of paper. In this case, you will demonstrate that you have successfully practiced strategies commonly used by effective learners. The one-pager will help showcase your thoughts and will provide a reference for later review or further study of the topics.

Guidelines:

-						
• ((• F • V	Jse 8.5 x 11" unlined paper you will use the front of this paper). ill the entire paper Vriting must be in ink, no pencil. Jse color for illustrations.	 Include all required info (arrange it on page any Must show higher level PROCESSING of the info regurgitating every fact 	ormat way y THIN ormat t you l	on Needs to so bu choose). detail, tho ING and something before class arned. Must be cl	how a high level of effort, ught, and care. This is not you scribble out during brunch ss starts! ear, easy to read, understandable	
Re	quired Information:					
	Chapter number and title			Visual representations of th	ne important aspects of the chapter	
	Must address all the Review Topics above	Topics above f equations if applicable).		Two higher level questions about the concepts INCLUDING		
	Key equations (with names of equations i			answers. These are not cal	rs. These are not <i>calculations</i> to solve. motated/explained "representative practice problems" y topics related to math. If no math in the chapter then	
	List of key concepts/topics			Two annotated/explained ' for any topics related to ma		
	Five most important vocabulary words/te	rms		does not need to be include	need to be included.	
	Explanations of words or ideas that corres	respond to the chapter		A 10 sentence paragraph that summarizes and connects the nformation together. Will be done below on this side of the		
	A "warning" or "tips" section			paper.		

Ten Sentence Summary - Pretend you are writing a little miniature textbook selection for this chapter!

Dougherty Valley HS Chemistry Study Guide Reactions and Stoichiometry Chapters



This list is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. + denotes calculations

Reactions

- Balancing Reaction
- Identifying Types of Reactions
 - o Synthesis
 - \circ Decomposition
 - Single Replacement
 - o Double Replacement
 - Combustion
- Predicting Products
 - First identify type of reaction! Then follow patterns
 - Don't forget to make neutral compounds when ionic. Cross over from scratch!
 - Single replacement \rightarrow use activity series to see if it actually happens
 - Do not need to memorize the activity series, just use it if given. If not given then you assume the reaction happens.
 - Double replacement \rightarrow use solubility rules to determine phases
 - Do not need to memorize the solubility rules, just use if given.
 - Soluble = Aqueous → breaks apart into ions
 - Insoluble = Solid (a precipitate) → doesn't break apart into ions
 - Gases and liquid do not break apart into ions
 - Net Ionic
 - Be able to use solubility rules to break apart aqueous into ions
 - Identify and remove spectator ions
 - Do not need to do Net Ionic unless asked.

Stoichiometry

- + Calculate Molar mass
- + Molar Conversions
 - o Grams A, moles A, molecules A
 - Extra conversions such as adding in a metric conversion, or a density, etc.
- Identify mole ratios
- + Stoichiometry problems when converting from molecule A to molecule B
 - All combos of mole highway pathways
 - Extra conversions such as adding in a metric conversion, or a density, etc.
 - Be able to show work using <u>dimensional analysis set up with all units shown!</u>
 - Getting the right numerical answer is not enough we are assessing a skill!
 - Real life stoichiometry problems
 - Identify actual <u>question</u> is, your stoich is the justification to your answer to the real life Q.
- + Yields

+

- o Theoretical yield
- o Actual yield
- Percent Yield

Dougherty Valley HS Chemistry Evidence of Self Study Chapter 1 Chemistry Basics, Chapter 2 Nuclear Chemistry



You must fill this page <u>front and back</u> with evidence that you have self-studied the chapters indicated in the title of this page. You can do practice problems from the starred optional worksheets given to you during the year, you can take notes on YouTube videos, you can take notes during a study session, you can make a new one pager type assignment, you can find extra problems on the internet to do, etc etc etc. If you need more than this piece of paper to show adequate studying of the chapters (a really good idea!) then just staple extra to this paper. You should be studying a minimum of an hour per chapter before the final. This assignment should show significant thought, effort, and time spent reviewing for youTube video, list who you were studying with, etc.

Dougherty Valley HS Chemistry Evidence of Self Study Chapter 3 Electrons, Chapter 4 Periodic Table



You must fill this page <u>front and back</u> with evidence that you have self-studied the chapters indicated in the title of this page. You can do practice problems from the starred optional worksheets given to you during the year, you can take notes on YouTube videos, you can take notes during a study session, you can make a new one pager type assignment, you can find extra problems on the internet to do, etc etc etc. If you need more than this piece of paper to show adequate studying of the chapters (a really good idea!) then just staple extra to this paper. You should be studying a minimum of an hour per chapter before the final. This assignment should show significant thought, effort, and time spent reviewing for youTube video, list who you were studying with, etc.

Dougherty Valley HS Chemistry Evidence of Self Study Chapter 5 Bonding and Structure, Chapter 6 Reactions



You must fill this page <u>front and back</u> with evidence that you have self-studied the chapters indicated in the title of this page. You can do practice problems from the starred optional worksheets given to you during the year, you can take notes on YouTube videos, you can take notes during a study session, you can make a new one pager type assignment, you can find extra problems on the internet to do, etc etc etc. If you need more than this piece of paper to show adequate studying of the chapters (a really good idea!) then just staple extra to this paper. You should be studying a minimum of an hour per chapter before the final. This assignment should show significant thought, effort, and time spent reviewing for your final! Please clearly identify what your evidence is – label if it is from a specific worksheet, give the link to the YouTube video, list who you were studying with, etc.

Dougherty Valley HS Chemistry Evidence of Self Study Chapter 7 Stoichiometry



You must fill this page <u>front and back</u> with evidence that you have self-studied the chapters indicated in the title of this page. You can do practice problems from the starred optional worksheets given to you during the year, you can take notes on YouTube videos, you can take notes during a study session, you can make a new one pager type assignment, you can find extra problems on the internet to do, etc etc etc. If you need more than this piece of paper to show adequate studying of the chapters (a really good idea!) then just staple extra to this paper. You should be studying a minimum of an hour per chapter before the final. This assignment should show significant thought, effort, and time spent reviewing for youTube video, list who you were studying with, etc.

Dougherty Valley HS Chemistry Evidence of Bing-Bing-Toe Review Participation Chapters 1 and 2 – Chemistry Basics & Atomic Structure, Nuclear Chemistry

S-20

You must participate during the Bing-Bing-Toe Review activity! Please make sure to do the following so you can earn full credit for this assignment:

- Number each problem to match the PowerPoint numbering
- Highlight the question numbers so I can quickly and easily give you points!
- Show any/all work if applicable
- Show all final answers
- Correct your answers if they were wrong!
- Staple binder paper to the back of this if you ran out of space.

Dougherty Valley HS Chemistry Evidence of Bing-Bing-Toe Participation – Questions

าร

Period:

Seat#:

-201

Directions: Any questions that were not completed in class as part of the Bing-Bing-Toe Game need to be finished as homework. Here are all the questions that were part of the review game if you missed any during the game, didn't finish the game in class, or you were absent. Remember to show work for ANY math problems, include ALL units, and non-math questions should have good/detailed answers but do not need to be in sentence form unless asked for specifically.

1) How many atoms are in one molecule of AI(OH)₃?

Name:

- 2) What particle did Thompson discover and which experiment proved it?
- 3) What Three parts of Dalton's theory remain true today?
- **4)** Do any of these atoms represent isotopes? If so, which ones and why?



- **5)** What Two parts of Dalton's theory have been proven false?
- 6) Name the phases of matter
- 7) Name all phase changes and what phases the change is between
- **8)** Draw a diagram for Rutherford's Experiment. Explain what it proved about atomic structure
- 9) Name an element with similar properties to lodine.
- 10) How do you calculate mass number?
- 11) How many valence Electrons do Halogen elements have?
- **12)** Define chemical change and physical change. Give an example of each.
- **13)** Name the three subatomic particles and give their relative masses.
- 14) Convert 15mi/day into in/sec
- 15) Classify Each Substance Below as: Pure Substance (element or compound) Mixture (homogeneous or heterogeneous).
 Calcium Cookies and Cream Ice Cream Carbon Dioxide Tap Water

Italian Salad dressing

- **16)** How many valence electrons do the alkali metals have and what is the charge of their ions?
- **17)** What radioactive emission changes a neutron into a proton?
- **18)** The half-life of thorium-227 is 18.72 days. How many days are required for three-fourths of a given amount to decay?
- **19)** What radioactive emission changes a neutron into a proton?
- **20)** How many protons and neutrons are in the nuclei of TI-204 atoms?
- 21) Uranium-235 undergoes alpha emission. What is the balanced eq.?
- **22)** Neutron initiated fission of U-235 results in the release of 4 beta particles, the formation of Sr-90 and the release of another nucleus. What is the other nucleus?
- 23) Calculate the average atomic mass of Magnesium from these data. Magnesium occurs in nature in three isotopic forms: Mg-24 (78.70% abundance) , Mg-26 (11.17% abundance) , Mg-25 (10.13% abundance)
- **24)** What is nuclear fission?
- **25)** A substance has a density of 1.39g/ml. You have 10g of the substance. What volume (in L) do you have?
- **26)** How many decigrams are in 437 kg? Write in scientific notation!
- **27)** How many sig. figs are in the following values? 612 kg 0.00067 ml 309.4 g
- **28)** Perform the calculation using accurate sig figs 1.31 cm x 2.3 cm =
- **29)** Perform the calculation using accurate sig figs 8.264 g 7.8 g =
- **30)** A radioactive substance has a half-life of 125 days. What percent is left after 1.45 years?

Dougherty Valley HS Chemistry Evidence of Grudge Ball Review Participation Chapters 3 and 4 – Electrons, Periodic Table



You must participate during the Grudge Ball Review activity! Please make sure to do the following so you can earn full credit for this assignment:

- Number each problem to match the PowerPoint numbering
- Highlight the question numbers so I can quickly and easily give you points!
- Show any/all work if applicable
- Show all final answers
- Correct your answers if they were wrong!
- Staple binder paper to the back of this if you ran out of space.

Dougherty Valley HS Chemistry Evidence of Grudge Ball Participation – Questions

S – 21B

Name:

Period:

Seat#:

Directions: Any questions that were not completed in class as part of the Grudge Ball Game need to be finished as homework. Here are all the questions that were part of the review game if you missed any during the game, didn't finish the game in class, or you were absent. Remember to show work for ANY math problems, include ALL units, and non-math questions should have good/detailed answers but do not need to be in sentence form unless asked for specifically.

- 1) Which element is this? $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$
- 2) Give name and write out noble gas notation: 1s² 2s² 2p⁶ 3s² 3p⁶ 4s² 3d¹⁰ 4p⁶ 5s² 4d²
- 3) What does the Pauli Exclusion Principle say?
- 4) What does the Aufbau Principle say?
- 5) Draw the orbital diagram for carbon. How many unpaired e- does it have?
- 6) What is the noble gas configuration for calcium?
- 7) How many unpaired electrons are in chromium?
- 8) How many orbitals in a set of each type/shape orbital?
- 9) What is the highest energy level in the element below: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$
- **10)** Which element might form a ion by losing electrons from the s and d orbitals F, S, Li, Ti
- 11) What is the atomic radius?
- 12) Atomic radius increases as you go (left or right?) and (up or down?)
- **13)** Atomic radius decreases going right because ______ and increases going down because ______
- 14) Order these elements from smallest to largest?Se,S,CINa
- **15)** Of the elements in the alkaline earth metals which has the highest electronegativity
- **16)** Why does it take less energy to remove e- as you go down a group?
- 17) Describe the trend for reactivity of halogens.
- **18)** What is the <u>sum</u> of the charges from the atoms below when they are ions? Calcium, nitrogen, and strontium
- 19) How many electrons are in a set of p orbitals?

- **20)** What is the term for the ability of metals to be pounded and shaped into sheets?
- 21) What is the definition of ionization energy?
- **22)** Predict the ions of the following atoms and then rank the ions from smallest to largest radius S, P, Cl, Ca, K
- **23)** Electronegativity increases going (left or right?) and increases going (up or down?)
- 24) Which element is in period 4 group 3B
- **25)** Draw a diagram for absorption and emission.
- 26) What is the e- configuration for copper (II)?
- 27) How many electrons can fit in a d orbital?
- **28)** Electronegativity (increases or decreases?) as you move down a group. WHY?
- **29)** Does Metallic Character (reactivity) increase or decrease going down a group?
- 30) Define "effective nuclear charge."
- **31)** Give an example of two ions that each have a larger atomic radius than their neutral parent atom.

Dougherty Valley HS Chemistry Evidence of Board Game Review Participation Chapters 5 and 6 – Bonding and Structure, Reactions



You must participate during the Board Game Review activity! Please make sure to do the following so you can earn full credit for this assignment:

- Number each problem to match the PowerPoint numbering
- Highlight the question numbers so I can quickly and easily give you points!
- Show any/all work if applicable
- Show all final answers
- Correct your answers if they were wrong!
- Staple binder paper to the back of this if you ran out of space.

Dougherty Valley HS Chemistry Evidence of Board Game Review Participation – Questions

S – 22B

Seat#:

Name:

Period:

Directions: Any questions that were not completed in class as part of the Board Game Review need to be finished as homework. Here are all the questions that were part of the review game if you missed any during the game, didn't finish the game in class, or you were absent. Remember to show work for ANY math problems, include ALL units, and non-math questions should have good/detailed answers but do not need to be in sentence form unless asked for specifically.

- 1) What is the name of the compound SrO?
- 2) What is the molar mass for the hydrocarbon $C_{24}H_{37}O_6$
- 3) What happens to the electrons during a metallic bond?
- **4)** What type of bond forms between two nonmetals share electrons?
- 5) Balance the following reaction and identify the mole ratio between the two reactants. $CH_4 + O_2 \rightarrow$
- 6) What are the dominant intermolecular forces present in water?
- 7) Rank the bulk forces in order of strength from weakest to strongest.
- 8) What is the formula for copper (IV) sulfate?
- 9) What kind of a reaction is this? Na + CaSO₄ \rightarrow
- **10)** Which molecule has covalent bonding and does not require a double or triple bond? CO₂, CO, N₂, Cl₂
- 11) Draw the Lewis dot structure for BrO3-
- 12) What is the VSEPR geometry for carbon tetrachloride?
- **13)** What is the molar mass of (NH₄)₂S?
- **14)** What is the VSEPR geometry for ammonia?
- **15)** Draw the Lewis Dot structure for nitrogen gas.
- 16) What kind of a reaction requires O2 as a reactant?
- **17)** Predict the products and balance the following reaction: aluminum phosphate plus rubidium nitrite
- **18)** In a 'polar' bond, the elements involved are sharing the electron(s)...
- **19)** If you have 10 mol of Zn, how many mols of ZnO can be produced? $3Zn+Al_2O_3 \rightarrow 3ZnO+2Al$
- **20)** If you have 25g of Zn, how many g of ZnO can be produced? 3Zn+Al₂O₃→3ZnO+2Al
- 21) Name the seven diatomic elements.

- 22) What is the molar mass of AI(OH)₃?
- **23)** If you have 38L of O₂ at STP, how many L of H₂O can you make, assuming your water is gaseous? $2H_2 + O_2 \rightarrow 2H_2O$
- 24) Draw the Lewis dot structure for AIH₃
- **25)** What is the mole ratio of TNT to carbon monoxide? $C_7H_5N_3O_6 \rightarrow CO + C + H_2O + N_2$
- 26) What is the formula of sodium carbonate?
- 27) What is the molar mass of sodium carbonate?
- 28) What is the molar mass of iron (III) sulfate
- **29)** How many moles of iron (III) sulfate in 44.5g iron (III) sulfate? The molar mass is 400.1 g/mol.
- **30)** How many grams potassium chloride are in 14.6 moles potassium chloride? 1 mole = 74.5 g
- **31)** How many grams of iron (III) carbonate are found in 5.46 moles iron (III) carbonate?
- **32)** Aqueous copper(II) bromide reacts with aqueous aluminum chloride. What type of reaction is this?
- **33)** Aqueous copper(II) bromide reacts with aqueous aluminum chloride. Balance this equation and predict the products.
- **34)** How many moles of sodium carbonate are in 10.9 g sodium carbonate? Molar mass is 106 g
- 35) What is the mole ratio of iron(III) sulfate to sodium sulfate? Fe₂(SO₄)₃ + 3Na₂CO₃ → Fe₂(CO₃)₃ + 3Na₂SO₄
- 36) If 10 moles iron (III) sulfate reacts, how many moles sodium sulfate will form? Fe₂(SO₄)₃ + 3Na₂CO₃ → Fe₂(CO₃)₃ + 3Na₂SO₄
- **37)** If 15 g oxygen is reacted with hydrogen, then how many moles water will be produced?
- **38)** What are three of the four indications that a chemical reaction has occurred?
- **39)** If 46 g sodium metal reacts completely, how many moles chlorine gas will be required to make sodium chloride?

Dougherty Valley HS Chemistry Evidence of Board Game Review Participation – Questions

- **40)** If 100 g sodium chloride reacts completely with barium, then how many grams sodium metal will be obtained? $2NaCl + Ba \rightarrow BaCl_2 + 2Na$
- **41)** How many liters fluorine gas in 0.87 moles of fluorine gas at STP?
- **42)** How many grams of oxygen gas are in 0.69L of oxygen gas at STP?
- **43)** $2H_2S + 3O_2 \rightarrow 2SO_2 + 2H_2O$ How many moles of H_2S are required to form 8.20 moles of SO_2 ?
- **44)** 2NaClO₃→2NaCl+3O₂ How many molecules of oxygen are produced when 80.0 grams of sodium chloride are produced?
- **45)** Na₂S₂O_{3(aq)} + $4Cl_{2(g)} + 5H_2O_{(aq)} \rightarrow 2NaHSO_{4(aq)} + 8HCl_{(aq)}$ How many moles of H₂O react if 5.24 x 10¹⁹ molecules of HCl are formed?
- **46)** Draw the Lewis structure and identify the VSEPR geometry for BCl₃.
- 47) Which electrons are involved in bonding?
- **48)** How many electrons does Antimony need to gain or lose to have a full valence shell?
- 49) How many valence electrons are available in NF₃?
- **50)** Identify if the following are ionic or covalent: LiF, CH₄, CH₃OH, NH₃, MgO
- 51) List the first ten prefixes used to name covalent molecules
- 52) Name C₂H₆
- 53) Name Ag₂O
- 54) Name Cu(NO₂)₃
- 55) Name SO₆
- 56) Draw the Lewis structure for BaS
- 57) Draw the Lewis Structure for CH₃OH
- 58) How many lone pairs does CH4 have?
- 59) How many lone pairs does NH3 have?
- 60) Is SF2 polar or non-polar?
- 61) Is SiO₂ polar or non-polar?
- 62) Which is more polar, CHCl₃ or CHBr₃

- 63) Identify the main IMF present in F₂
- 64) Identify the main IMF present in HCI
- 65) Identify the main IMF present in C (graphite)
- **66)** What is the sum of the coefficients when balanced: $Ag + S \rightarrow Ag_2S$

Dougherty Valley HS Chemistry Fall Final Exam - Practice Test



This practice test is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. **Please time yourself! This practice test should take a maximum of** <u>150 minutes</u> to ensure you are going fast enough to finish the actual Test in class!

re going fast enough to finish the actual Test in cl	ass!
 What is the correct chemical formula for copper(II) oxide? A) Cu₃O₂ B) Cu₂O₃ C) CuO D) CuO₃ E) Cu₃O 	 8. What is the name of the compound whose formula is NO₂ A) Dinitrogen oxide B) Nitrogen oxide C) Nitrogen (V) oxide D) Nitrogen pentoxide E) nitrogen dioxide
 List the three main subatomic particles. An example of a chemical change is A) an ice cube melting in a drink B) digesting a pizza C) coffee spilled on a shirt D) boiling alcohol E) grinding coffee beans. 	 9. How many protons, electrons, and neutrons, respectively, does A) 8, 18, 16 B) 8, 14, 8 C) 8, 18, 8 D) 8, 10, 8 E) 8, 8, 8
 4. With which of the following would fluorine atoms MOST easily combine to form an ionic compound? A) sulfur B) carbon C) oxygen D) chlourine E) Sodium 	 How many grams of H₂O will be formed when 32.0 g H₂ is mixed with O₂ and allowed to react to form water? A) 22.5 g B) 144 g C) 90.1 g D) 45.0 g E) 286 g
5. The correct formula for iron(III) phosphide is A) FeP_3 B) Fe_3P C) Fe_2P_3 D) FeP E) Fe_3P_2	 11. Which of the following atomic symbols is incorrect? A) ³⁹₁₉K B) ¹⁴₈N C) ¹⁴₆C D) ³⁷CI
 6. Consider a certain type of nucleus that has a half-life of 32 min. Calculate the percent of original sample of nuclides remaining after 2.5 hours have passed. A) 40 % B) 3.9 % C) 96.1 % D) 3.2 % E) 6.9 % 	 E) ¹⁷₁₅Cl E) ³²₁₅P 12. How many atoms are represented by one molecule of aluminum dichromate, Al₂(Cr₂O₇)₃? A) 25 B) 29 C) 9 D) 27
 7. Which of the following exhibits the correct orders (large to small) for both atomic radius and ionization energy, respectively? A) Te, Br, Se, and Te, Br, Se B) Te, Se, Br, and Br, Se, Te C) Br, Se, Te, and Te, Se, Br D) Se, Br, Te, and Te, Br, Se E) Br, Te, Se, and Se, Te, Br 	 E) 14 13. Which of the following <i>BEST</i> describes alkali metal? A) They have one valence electron, and they form ions with a 1+ charge. B) They have one valence electron, and they form ions with a 2- charge C) They have one valence electron, and they form ions with a 1- change. D) They have two valence electrons, and they form ions with a 2+ charge.

E) They have two valence electrons, and they form ions with a 2- charge.

 14. Which of the following is the atomic number of a halogen? A) 17 B) 136 C) 27 D) 10 E) 13 	 22. An atom with 15 protons and 16 neutrons is an atom of A) S B) Pd C) Rh D) P E) Ga
 15. The cesium-131 nuclide has a half-life of 30 years. After 90 years, about 6 g remains. The original mass of the cesium-131 sample is closest to A) 70 g B) 30 g C) 60 g D) 40 g E) 50 g 	 23. 1s²2s²2p⁶3s²3p⁶ Represents this type of element A) Noble Gases B) Halogens C) Alkali Metals D) Metal/Non-metal E) Alkaline Earth Metals
 16. Balance the following equation in standard form and determine the sum of the coefficients. FeO(s) + O₂(g) → Fe₂O₃(s) A) 7 B) 3 C) 14 	 A) Alkali Metals B) Noble Gases C) Non-metal D) Alkaline Earth Metals E) Halogens 25. The cation of table salt is made from one of these types of elements
 D) 6 E) 4 17. Calculate the molar mass of NaHSO₄. A) 132 g/mol B) 124 g/mol C) 120 g/mol 	 A) Alkaline Earth Metals B) Noble Gases C) Alkali Metals D) Metal/Non-metal E) Halogens
D) 100 g E) 120 g 18. How many d electrons are there in an iron atom? A) 3 B) 6 C) 26	 26. These elements become more reactive as you decrease their atomic number. A) Alkaline Earth Metals B) Metal/Non-metal C) Halogens D) Noble Gases E) Alkali Metals
 D) 56 E) 2 19. If a 100g sample of platinum metal has a volume of 4.668 mL, what is the density of platinum in g/cm³? A) 2.14 g/cm³ B) 0.0467 g/cm³ 	 27. Barium is this type of element A) Metal/Non-metal B) Halogens C) Alkaline Earth Metals D) Noble Gases E) Alkali Metals
 C) 467 g/cm³ D) 21.4 g/cm³ E) none of these 20. What is the chemical formula for Mercury (I) oxide A) Hg₂O₄ B) HgO₂ 	 28. What type of rxn is CH₄ + O₂ → CO₂ + H₂O (unbalanced) A) synthesis B) decomposition C) combustion D) single replacement
C) HgO D) Hg2O ₂ E) Hg ₂ O 21. The prefix "penta" means	 E) double replacement 29. The number of neutrons in one atom of ²⁰⁶₈₂Hg is A) 124 B) 82

- A) 2
 B) 3
 C) 4
 D) 5
 E) 1

- C) 288
 D) 206
 E) none of these

30. The noble gas electron configuration for Cr^{2+} is

- A) $[Ar]4s^23d^2$
- B) $[Ar]4s^23d^4$
- C) $[Ar]4s^{1}3d^{5}$
- D) [Kr]3d⁴
- E) [Ar]3d⁴
- 31. 28g of nitrogen dioxide and excess water are allowed to produce nitric acid (HNO₃) and nitrogen monoxide. If 22g of nitric acid are produced what is the percentage yield?A) 100%
 - B) 56.27%
 - C) 86.05%
 - D) 113.64%
 - E) 72.43%

32. Identify the missing particle in the following equation:

 $\begin{array}{ccc}
238 & 4 \\
92 & U \rightarrow {}^2 & \text{He} + ? \\
234 \\
92 & U \\
242 \\
94 & \text{Pu}
\end{array}$

C) 234

A)

B)

- 90 Th 242
- D) 242 90 Th
- E) none of these

33. According to the following Nuclear Equation,

- ²³⁸₉₂U \rightarrow ²³⁴₉₀Th + ____, which particle is produced? A) $\frac{4}{2}He$
- B) $\begin{bmatrix} 0\\-1 \end{bmatrix} \beta$
- C) $\stackrel{-1}{+1}\beta$
- D) $\frac{1}{0}n$
- E) 0γ
- 0/
- 34. When balanced, what is the sum of the coefficients? Al₂(SO₄)₃+Ca(OH)₂ \rightarrow Al(OH)₃+CaSO₄
 - A) 3
 - B) 4
 - C) 9
 - D) 10
 - E) 8
- 35. How many protons are in a neutral atom with the electron configuration below? 1S²2S²2P⁶3S²3P⁴
 - A) 14
 - B) 10
 - C) 12
 - D) 17
 - E) 16
 - 36. The electron configuration for the sulfur atom is
 - A) $1s^2 2s^2 2p^6 3s^2 3p^4$
 - B) $1s^22s^22p^63s^23p^5$
 - C) $1s^2 2s^2 2p^4$
 - D) $1s^2 2s^2 2p^6 3s^5$
 - E) $1s^22s^22p^63s^23p^2$

- 37. 238 Which of the following is a product of α decay of 92 U? A) 238
 - ⁹³ Np B) ²³⁵
 - B) 235 92 Pu
 - C) 234 90 Th
 - D) 238
 - ⁹¹ Pa
 - E) 235
 - 92 U
- 38. Which of the following is an element?
 - A) oxygen
 - B) brass
 - C) earth
 - D) salt
 - E) water
- 39. A particular radioactive element has a half-life of 6.95 days. What percent of the original sample is left after 15.0 days?
 - A) 11.2%
 - B) 22.4%
 - C) 44.8%
 - D) 47.3%
 - E) 77.6%
- 40. Which of the following elements is an alkaline earth metal?
 - A) Cu
 - B) Fe
 - C) Sc
 - D) CaE) Na
- 41. How many neutrons are contained in an iodine nucleus with a mass number of 131?
 - A) 78
 - B) 53
 - C) 127
 - D) 131
 - E) 74
- 42. Alpha particles are
 - A) protons
 - B) helium nuclei
 - C) X rays
 - D) neutrons
 - E) electrons
- 43. How many electrons are in the fourth principal energy level (n = 4) of one atom of Br?
 - A) 18
 - B) 2
 - C) 7
 - D) 17
 - E) none of these

44. How many atoms of hydrogen are in one molecule of CH₃Cl?

- A) 3
- B) 30×10^{23}
- C) 6×10^{23}
- D) 18×10^{23}
- E) 6
- 45. Titanium(IV) oxide has the formula
 - A) Ti(IV)O
 - B) TiO₂
 - C) TiO₄
 - D) Ti_4O_2
 - E) Ti₄O
- 46. Which of the following elements is most similar to lithium?A) Na
 - A) Na B) Hg
 - b) пg C) Mg
 - C) Mg
 - D) Au E) He
- 47. The chemical formula for dicarbon hexahydride is
 - A) C_3H_8
 - B) CH₂
 - C) CH₄
 - D) CH
 - E) C₂H₆
- 48. The number of a certain radioactive nuclide present in a sample decays from 160. to 20. in 32 minutes. What is the half-life of this radioactive species?
 - A) 21 minutes
 - B) 16 minutes
 - C) 26 minutes
 - D) 11 minutes
 - E) 6 minutes
- 49. Which of the following has the electron configuration $1s^22s^22p^63s^23p^64s^23d^5$?
 - A) Ca
 - B) Cl
 - C) Br
 - D) Cr
 - E) Mn
- 50. When an electron in the ground state absorbs energy, it goes to a(n) ______ state.
 - A) ionic
 - B) stable
 - C) excited
 - D) lower
 - E) frenetic
- 51. Consider a certain type of nucleus that has a rate constant of $2.10 \times 10^{-2} \text{ min}^{-1}$. Calculate the time required for the sample to decay to one-fourth of its initial value.
 - A) 66.0 min
 - B) 2.10 min
 - C) 41.3 min
 - D) 0.0420 min
 - E) 33.0 min

- 52. A sample of a radioactive element decays to 27.3% of its original amount of radioactive nuclides in 15 years. What is the half-life of this radioactive element?
 - A) 8.7 yearsB) 33. years
 - C) 92.0 years
 - D) 2.5 years
 - E) 8.0 years

Use the following to answer question 53:

Consider the following molecules. I.BF₃

II.CHBr₃ (C is the central atom) III.Br₂ IV.XeCl₂

V.CO

 $VI.SF_4$

Select the molecule(s) that fit the given statement.

- 53. These molecules follow the octet rule.
 - A) II, III, V
 - B) I, IV, VI
 - C) I, III, IV, VI
 - D) I, II, IV
 - E) III, V, VI

Use the following to answer questions 54-58:

$$H_2(g) + \underline{CO}(g) \rightarrow \underline{CH_3OH}(l)$$

$$68.5 \text{ kg}$$

- 54. Which of the following sets of coefficients represent those of the balanced equation?
 - A) 1, 1, 1
 - B) 2, 2, 1
 - C) 1, 2, 2
 - D) 2, 1, 2
 - E) 2, 1, 1
- 55. How many moles of the product are produced?
 - A) 8.60 x 10³
 - B) 4.27×10^3
 - C) 2.45 x 10³
 - D) 2.14 x 10³
 - E) 8.54 x 10³
- 56. What is the percent yield if the actual yield is 3.57 x 10⁴ g?A) 92%
 - B) 88%
 - C) 46%
 - D) 103%
 - E) 76%
- 57. What was the theoretical yield?
 - A) 3.57 x 10⁴ g
 - B) 2.45 x 10^3
 - C) 7.83 x 10⁴ g
 - D) 0.456 g
 - E) Not able to be determined
| 58. | How many moles of H_2 were needed to use up all
of the CO?
A) 2.74 x 10 ²
B) 8.60 x 10 ³
C) 4.89 x 10 ²
D) 1.20 x 10 ⁵
E) 3.56 x 10 ³ | 66. | The symbol for the element strontium is
A) Str
B) Sr
C) St
D) Sm
E) S
Butherford's experiment was important because it showed: |
|------------|--|-----|---|
| 59. | An element has the electron configuration [Kr]5s²4d¹⁰5p². The element is a(n) A) actinide. B) nonmetal. C) lanthanide. D) transition element. E) metal. | 07. | A) the mass of the atom is uniformly distributed throughout the atom. B) a zinc sulfide screen scintillates when struck by a charged particle. C) an atom is mostly empty space. D) gold foil can be made to be only a few atoms thick. E) radioactive elements give off alpha particles. |
| 60. | Which type of rxn: HCl+ KOH→ KCl + H₂O (unbalanced) A) Double Replacement B) Combustion C) decomposition D) Single Replacement E) Synthesis | 68. | When ethane (C ₂ H ₆) is reacted with oxygen in the air, the
products are carbon dioxide and water. This process requires
mol of oxygen for every 1.13 mol of ethane.
A) 2.82
B) 7.91
C) 1.13
D) 5.09 |
| 61. | How many neutrons are there in one atom of $^{47}_{22}$ Ti?
A) 68
B) 46
C) 22
D) 24
E) none of these | 69. | E) 3.95 Calculate the number of moles in 2.43 kg of Be A) 0.270 B) 27.0 C) 843 |
| 62. | A 42.9-g sample of Ca contains how many calcium atoms?
A) 6.45×10^{23} atoms
B) 2.58×10^{25} atoms
C) 42.9 atoms
D) 1.07×10^{0} atoms
E) 85.8 atoms | 70. | D) 270
E) 0.000270
$C_3H_8 + O_2> CO_2 + H_2O$
What are the coefficients when you balance the above equation?
A) 1,1,1,1
B) 2,6,4,6
C) 4,7,5,2 |
| 63.
64. | A phosphorus atom needs to gain electrons
to achieve a noble gas configuration.
A) 3
B) 6
C) 2
D) 4
E) 5
Which of the following could be an atomic number
for a Halogen
A) 4 | 71. | D) 2,2,2,2
E) 1,5,3,4
Suppose the unbalanced reaction
$Ca_3(PO_4)_2 + H_2SO_4 \rightarrow CaSO_4 + H_3PO_4$ is carried out starting
with 103 g of $Ca_3(PO_4)_2$ and plenty of H_2SO_4 . How much
phosphoric acid (H ₃ PO ₄) will be produced?
A) 65.1 g
B) 108.0 g
C) 39.5 g
D) 59.3 g |
| 65. | A) 4 B) 54 C) 35 D) 11 E) 16 Which of these is an element? A) brass B) silver C) iron ore D) water | 72. | D) 59.3 g E) 88.9 g How many atoms of oxygen are in one molecule of calcium hydrogen sulfate? A) 4 B) 8 C) 3 D) 5 E) 6 |
| | E) wood | | |

- 73. How many molecules of CH_4 are in 65 grams of CH_4 ?
 - A) 3.1 x 10²⁴ atoms
 - B) 4×10^{24} atoms
 - C) 2.4 x 10²⁴ atoms
 - D) 1.4 x 10²⁴ atoms
 - E) 2.5×10^{24} atoms
- 74. Antimony can be represented by which of the following noble gas configurations?
 - A) [Kr]5s²4d¹⁰5p⁶
 - B) $[Kr]5s^25d^{10}5p^6$
 - C) $[Kr]5s^24d^{10}5p^5$
 - D) [Kr]5s²4d¹⁰5p³
 - E) [Kr] $5s^25d^{10}5p^5$

75. What is the mass of 8 atom(s) of copper in grams?

- A) 6.022×10^{23} g
- B) 8.44×10^{-22} g
- C) 1.18×10^{21} g
- D) 4.78×10^{-24} g
- E) 508.4 g

76. What type of reaction is Mg + $O_2 \rightarrow$ MgO (unbalanced)? A) Double Replacement

- B) Synthesis
- Single Replacement C)
- D) decomposition
- E) Combustion
- 77.

When ${}^{230}_{90}$ Th decays by producing an alpha particle, the product nuclide is _____

- $^{226}_{87}$ Ra A)
- $^{226}_{88}Fr$ B)
- $^{226}_{88}$ Ra C)
- $^{226}_{88}At$ D)
- $^{226}_{89}$ Ra E)

78. What is the sum of the coefficients for the reaction: $2NH_3(g) + 3O_2(g) \rightarrow 2NO_2(g) + 3H_2O(g)$

- A) 16
- B) 21
- C) 10
- D) 13 E) 4
- 79. An atom that has an electron configuration of $1s^22s^22p^63s^23p^6$ is classified as
 - A) an alkali metal
 - B) a halogen
 - C) a transition metal
 - D) an alkaline earth element
 - E) a noble gas element

- 80. Which of the following best describes the "trend" for electronegativity across periods (L->R) and down groups, respectively (periods/groups)?
 - A) Decrease / Increase
 - B) Increase / Increase
 - C) neither
 - D) Decrease / Decrease
 - E) Increase / Decrease
- 81. Phosphoric acid can be prepared by reaction of sulfuric acid with "phosphate rock" according to the equation:

 $Ca_{3}(PO_{4})_{2} + 3H_{2}SO_{4} \rightarrow 3CaSO_{4} + 2H_{3}PO_{4}$

Suppose the reaction is carried out starting with plenty of Ca₃(PO₄)₂ and 75.0 g of H₂SO₄. How many moles of phosphoric acid can be produced?

- A) 49.98 mol
- B) 1.15 mol
- C) 0.51 mol
- D) $4.9 \times 10^3 \text{ mol}$
- E) Cannot be determined

82. Consider the following reaction:

 $CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(g) + 4HCl(g)$

What mass of CCl₄ is formed by the reaction of 5.17 g of methane with an excess of chlorine?

- A) 795 g
- B) 12.4 g
- C) 49.6 g
- D) 0.54 g
- E) none of these
- 83. An atom with 45 protons has a mass number of 100. It must contain how many neutrons?
 - A) 45
 - B) 100
 - C) 55
 - 145 D)
 - none of these E)
- 84. A homogeneous mixture is also called ____
 - A) a pure substance.
 - B) an element.
 - C) a solution.
 - D) a heterogeneous mixture.
 - E) a compound.
- 85. In the following nuclear equation, identify the missing product:
 - 43 ${}^{45}_{20}\text{Ca} + {}^{2}\alpha \rightarrow \underline{\qquad} + {}^{1}\text{H}$
 - A) 4
 - 22 Ti B) 46
 - ²² Ti
 - C) 42 ¹⁸ Ar
 - D) 46
 - ²¹ Sc

86.	The name for NaHCO ₃ is	94. Which formula represents a trigonal pyramidal molecule
	A) sodium(I) hydrogen carbonate	(molecular geometry)?
	B) sodium hydrogen carbonate (sodium bicarbonate)	A) NH ₃
	C) sodium(I) bicarbonate	B) $CaCl_2$
	D) sodium carbonate	C) HBr
	E) none of these	D) CH_4
	,	E) Br_2
87.	Which of the following involves a chemical change?	, 2
	A) chopping wood	95. The maximum $\#$ of e- allowed in each of the <i>d</i> orbitals is
	B) condensation of water	A) 32
	C) cooking meat	B) 10
	D) melting ice	() $()$ $()$ $()$
	E) boiling water	D) 4
		F) 18
88	When magnesium and oxygen form a bond 2 electrons will be	
00.	A) I ost by oxygen gained by magnesium	96 Which of the following contains one or more covalent bonds?
	 A) Lost by magnesium gained by oxygen 	$A) = C_{\rm ex}O$
	C) Shared equally	$ \begin{array}{c} \mathbf{A} \\ \mathbf{B} \\ \mathbf{C} \\ \mathbf$
	D) evenly distributed	$ \begin{array}{c} \mathbf{D} \\ \mathbf{C} \\ \mathbf{D} \\ \mathbf{P} \\ \mathbf$
	D) evening distributed	$D = C_{1} C_{2}$
	E) shared unequality	D) CaO
00		E) NaCl
89.	An example of a mixture is	
	A) gold	97. How many grams of $Ca(NO_3)_2$ can be produced by reacting
	B) mercury liquid	excess HNO ₃ with 5.65 g of $Ca(OH)_2$?
	C) the air in this room	A) 11.3 g
	D) purified water	B) 25.0 g
	E) hydrogen fluoride	C) 5.65 g
		D) 12.5 g
90.	How many protons, electrons, and neutrons, respectively, does	E) 6.26 g
	$^{27}\text{Al}^{3+}$ have?	
	A) 13.10.14	98. Rank the following bonds from least polar to most polar :
	B) 13, 13, 13	Si-Cl P-Cl Mg-Cl S-Cl
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	A) Mg-Cl, S-Cl, P-Cl, Si-Cl
	D) 13 13 14	B) S-Cl, P-Cl, Mg-Cl, Si-Cl
	E) 13,13,27	C) S-Cl, P-Cl, Si-Cl, Mg-Cl
	L) 15, 15, 27	D) Mg-Cl, Si-Cl, P-Cl, S-Cl
01		\mathbf{E} \mathbf{D} \mathbf{C}^{\dagger} \mathbf{C}^{\dagger} \mathbf{C}^{\dagger} \mathbf{C}^{\dagger} \mathbf{M}_{π} \mathbf{C}^{\dagger}
21.	A stable element will have how many electrons?	E) P-CI, S-CI, SI-CI, MIG-CI
	A stable element will have how many electrons?	E) P-CI, S-CI, SI-CI, Mg-CI
	A stable element will have how many electrons?A) ZeroB) 6	99. How many molecules of the sodium containing product is made
	 A stable element will have how many electrons? A) Zero B) 6 C) 8 	99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below?
	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 	 P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na(1) + Al₂O_{3(s)} →
	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 	 E) P-Cl, S-Cl, Mg-Cl 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g
	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 	 E) P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na_(l) + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules
02	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 	 E) P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na_(l) + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? 	 E) P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? A) 0 B) 0 	 E) P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? A) 0 B) 9 C) 1 	 E) P-CI, S-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? A) 0 B) 9 C) 1 D) 2 	 E) P-CI, S-CI, SI-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? A) 0 B) 9 C) 1 D) 3 	 E) P-CI, S-CI, SI-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules 100. Balance the equation
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO ₃) ₃ ? A) 0 B) 9 C) 1 D) 3 E) 4 	 E) P-CI, S-CI, SI-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules 100. Balance the equation Zn(s) + H₂PO₄(aa) → Zn₂(PO₄)₂(s) + H₂(a)
92.	 A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO₃)₃? A) 0 B) 9 C) 1 D) 3 E) 4 	 E) P-CI, S-CI, SI-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na₍₁₎ + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules 100. Balance the equation Zn(s) + H₃PO₄(aq) → Zn₃(PO₄)₂(s) + H₂(g)
92. 93.	A stable element will have how many electrons? A) Zero B) 6 C) 8 D) 32 E) 18 How many nitrogen atoms are indicated in Al(NO ₃) ₃ ? A) 0 B) 9 C) 1 D) 3 E) 4 The electron configuration of carbon is $1s^2 2s^2 2p^2$. How many many electrone data are been are been with for the print of all 2	 E) P-CI, S-CI, SI-CI, Mg-CI 99. How many molecules of the sodium containing product is made at the end of the single displacement reaction below? Na(1) + Al₂O_{3(s)} → 5.79g A) 1.02 x 10²³ molecules B) 7.58 x 10²² molecules C) 2.16 x 10²² molecules D) 3.36 x 10²⁴ molecules E) 2.16 x 10²⁴ molecules 100. Balance the equation Zn(s) + H₃PO₄(aq) → Zn₃(PO₄)₂(s) + H₂(g)
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Has not been checked! Please tell me if you see typos!!!

Answer Key

1.	С	35. E	70.	E
2.	electron, proton,	36. A	71.	А
	neutron	37. C	72.	В
3.	В	38. A	73.	С
4.	Е	39. B	74.	D
5.	D	40. D	75.	В
6.	В	41. A	76.	В
7.	В	42. B	77.	С
8.	E	43. C	78.	В
9.	E	44. A	79.	E
10.	E	45. B	80.	E
11.	В	46. A	81.	С
12.	В	47. E	82.	С
13.	А	48. D	83.	С
14.	А	49. E	84.	С
15.	Е	50. C	85.	D
16.	А	51. D	86.	В
17.	С	52. E	87.	С
18.	В	53. A	88.	В
19.	D	54. E	89.	С
20.	Е	55. C	90.	А
21.	D	56. C	91.	С
22.	D	57. C	92.	D
23.	Α	58. C	93.	E
24.	C	59. E	94.	А
25.	C	60. A	95.	С
26.	C	61. E	96.	В
27.	C	62. A	97.	D
28.	C	63. A	98.	С
29.	A	64. C	99.	В
30.	E	65. B	100.	3Zn(s) +
31.	C	66. B		$2H_3PO_4(aq) \rightarrow$
32.	C	67. C		$Zn_3(PO_4)_2(s) +$
33.	A	68. E		$3H_2(g)$
34.	С	69. D		