

Name: _____

Period: _____

Seat#: _____

Directions: Try these problems. If you can DO them, check the box (☑).

If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

S47 – Quick Check #1

Potential Energy Diagrams

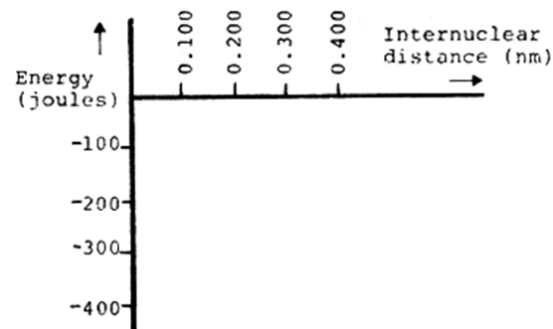
Sketch the potential energy involved as two hydrogen atoms approach each other.

As the two atoms get closer, the potential energy drops because of the _____

(attraction/repulsion) between the _____ and the _____.

The distance when the potential energy is a minimum is called

the _____ - _____ - _____.



Lewis Structures

Draw the following *Lewis Dot Diagrams*.

Be (ground state)	Be (bonding state)	Si (ground state)	Si (bonding state)

Draw the *Lewis Dot Diagram* for Calcium Chloride. This compound is _____ (covalent/ionic).

Explain how this bond was formed in terms of the electrons.

Draw the *Lewis Dot Diagram* for BeH₂. This compound is _____ (covalent/ionic).

Explain how this bond was formed in terms of the electrons.

Struggled? Got some wrong? Do some self-study!

State the octet rule: _____

Is the compound BeH_2 obeying the octet rule? _____

S48 – Quick Check #2

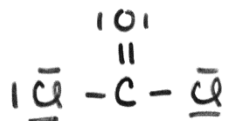
Lewis Structures

Draw the **Lewis structure** for CH_3F .

Draw the **Lewis structure** for SO_2 .

Formal Charge

Determine the **formal charge** for each atom in COCl_2 :



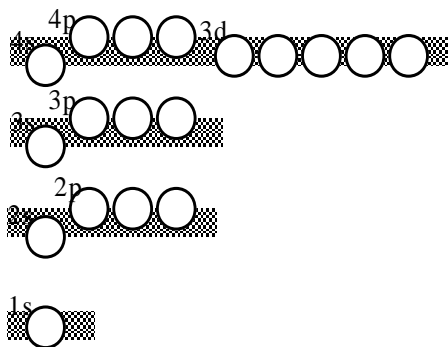
Draw the **Lewis structure** for CO_2 .

Then determine the **formal charge** and **oxidation number** of C in CO_2 .

S49 – Quick Check #3

Orbital Diagrams

Fill in the orbital diagram for bromine.



bromine
35
Br
79.904

Struggled? Got some wrong? Do some self-study!

Mixed Problems

Write the *short form electron configuration* for Bromine: [Ar] _____

Bromine can make five bonds in molecules such as BrF₅. Draw the Lewis dot structure for BrF₅.

Determine the *formal charge* for each atom in BrF₅ molecule. Br = _____ F = _____

Consider the central bromine atom in BrF₅:

of bonded atoms = _____ # of lone pairs = _____ Steric Number = _____

What is the *Electron-Pair Geometry* of BrF₅? _____

What is the *Molecular Geometry* of BrF₅? _____

S50 – Quick Check #4

Lewis Structures

Using VSEPR Theory, name and sketch the shape of the following molecules.

For extra practice identify formal charges and the electron and molecular geometries of the center atoms.

1. N ₂	2. H ₂ O	3. CO ₂
4. NH ₃	5. CH ₄	6. SO ₃
7. HF	8. CH ₃ OH	9. H ₂ S
10. I ₂	11. CHCl ₃	12. O ₂

Struggled? Got some wrong? Do some self-study!

S51 – Quick Check #5

Mixed Problems

Draw the Lewis Structure for BF_3 . Try to draw it in a way that takes into account the three dimensional shape and bond angles based on VSEPR theory. If applicable, correctly place the symbols $\delta+$ and $\delta-$ around your drawing to represent any net dipole that may exist.

Based on VSEPR theory, what shape would you assign to the molecule, BF_3 ?

The B-F bond is classified as _____ (Ionic/Polar-Covalent/Non-Polar Covalent)

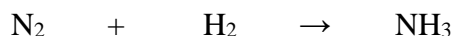
The molecule, BF_3 , _____ have a net dipole moment. (does/does not)

The molecule, BF_3 , is _____ (polar/non-polar)

Explain the reasoning for your answer:

Bond Energy

Balance the following equation and calculate the Energy of Formation (ΔH_f) of NH_3 using the bond energies provided. Write the energy term on the correct side of the equation.



This reaction is _____ (endothermic/exothermic).

Table 9.9 • Some Average Single- and Multiple-Bond Energies (kJ/mol)

	H	C	N	O	F	Si	P	S	Cl	Br	I
H	436	413	391	463	565	318	322	347	432	366	299

Multiple Bonds	$\text{N}\equiv\text{N}$	945
-----------------------	--------------------------	-----

Struggled? Got some wrong? Do some self-study!