Chunk #2

① $3.5\,mi \left| \frac{5280\,ft}{1\,mi} \right| \frac{12\,in}{1\,ft} \left| \frac{2.54\,cm}{1\,in} \right. =$

② $\frac{4\,mi}{1\,hr} \left| \frac{5280\,ft}{1\,mi} \right| \frac{12\,in}{1\,ft} \left| \frac{1\,m}{39.37\,in} \right| \left| \frac{1\,hr}{60\,min} \right| \frac{1\,min}{60\,sec}$

$=$

③ $\frac{19.2\,mi}{1\,min} \left| \frac{5280\,ft}{1\,mi} \right| \frac{12\,in}{1\,ft} \left| \frac{1\,m}{39.37\,in} \right| \left| \frac{60\,min}{1\,hr} \right. =$

④ $\frac{52\,m}{1\,s} \left| \frac{39.37\,in}{1\,m} \right| \frac{1\,ft}{12\,in} \left| \frac{1\,mi}{5280\,ft} \right| \left| \frac{60\,sec}{1\,min} \right| \frac{60\,min}{1\,hr}$

$=$

⑤ $Ca(OH)_2$ mm: 74.1 g/mol

$20\,g \left| \frac{1\,mol}{74.1\,g} \right. =$

⑥ mm = 174.27 g/mol

$15\,g \left| \frac{1\,mol}{174.27\,g} \right. =$

⑦ mm = 68.17 g/mol

$54\,mol \left| \frac{68.17\,g}{1\,mol} \right. =$

⑧ $0.056\,mol \left| \frac{107.87\,g}{1\,mol} \right. =$

⑨ $\frac{1.6\,mol}{} \left| \frac{98.09\,g}{1\,mol} \right. =$

⑩ $\frac{2.5 \times 10^{31}\,molecules}{} \left| \frac{1\,mol}{6.02 \times 10^{23}\,molecules} \right. =$

(11) area where an electron is most likely to be found - probability cloud

(12) 

s p

(13) 2

(14) 2, 6, 10, 14

(15)
3p ↑↓ ↑ ↑
3s ↑↓
2p ↑↓ ↑↓ ↑↓
2s ↑↓
1s ↑↓

(16)
3d ↑ ↑ ↑ ↑ ↑
4s ↑↓
3p ↑↓ ↑↓ ↑↓
3s ↑↓
2p ↑↓ ↑↓ ↑↓
2s ↑↓
1s ↑↓

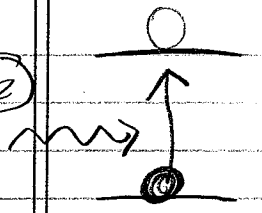
(17) fill bottom up, 2 e^- per orbital, one e^- in each p orbital before doubling up. Same w/ d & f orbitals

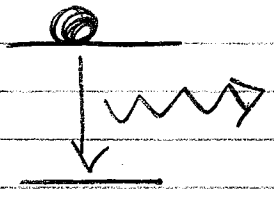
(18) Ge

(19) K

(20) $1s^2 2s^2 2p^6 3s^2 3p^3$

(21) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^9$

22.  absorbs energy, electron goes from ground state to excited state

23.  e^- returns to ground state and releases energy

24. ground state = lowest energy level an e^- can be in
excited state = a higher energy level than normal

25. Alpha $^{4}_{2}\alpha$ $^{4}_{2}He$ paper
beta $^{0}_{-1}\beta$ $^{0}_{-1}e$ foil
gamma $^{0}_{0}\gamma$ lead

26. gamma, beta, alpha

27. $\alpha = +2$ $\beta = -1$ $\gamma = 0$
negative positive neither

28. $^{99}_{43}Tc \rightarrow \underline{^{99}_{44}Ru} + {}^{0}_{-1}e$

29. $^{238}_{92}U \rightarrow \underline{^{234}_{90}Th} + \underline{^{4}_{2}He}$

30. $^{150}_{62}Sm \rightarrow {}^{0}_{-1}e + \underline{^{150}_{63}Eu}$