Lewis Structure & VSEPR WORKSHEET: **Name** _____

N-H
O-H
F-H

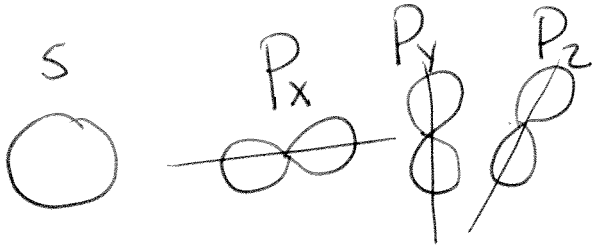
Lewis Structure	Electron Pair Geometry (EPG)	Molecular Geometry (MG)	Bond Angle(s)	Polarity	Hybridization
BF_3 B-3e⁻ 3F-21e⁻ 24e⁻	B-3B 0E	120°	120°	⌀ VDW	sp^2
NO_2^- N-5e⁻ 20-12e⁻ 1e⁻ 18	N-2B 1E	120°	120°	✓ dipole dipole	sp^2
CCl_4 C-4 4Cl-28 32e⁻	C-4B 0E	109°	109°	⌀ VDW	sp^3
H_3O^+ 3H-3e⁻ O-6e⁻ -1e⁻ 8e⁻	O-3B 1E	109°	109°	✓ H-bonding	sp^3
H_2S 2H-2e⁻ S-6e⁻ 8e⁻	S-2B 2E	109°	109°	✓ dipole dipole	sp^3
PF_5 P-5e⁻ 5F-35e⁻ 40e⁻	P-5B 0E	90° 120°	90° 120°	⌀ VDW	sp^3d

Station 1

1 a) → nucleus contains p^+ and n^0
→ electrons orbit in set energy levels
→ orbitals are 90% probability areas that contain e^-

2. Dalton - all things made of atoms
cathode rays - Thomson - Plum pudding model, atoms are positive gelly with negative e^-
gold foil - Rutherford - positive nucleus with cloud of e^- (e^- would crash into nucleus)
hydrogen line - Bohr - 1st quantum model
wave equation - Schrödinger - e^- are standing waves permiating all time and space
uncertainty principle - Heisenburg - e^- are matter, areas they are found in 90% of time are described by Ψ

3.



n size (energy shell) n = interger
ℓ shape (2^ℓ lobes) → s p d f ; 0 1 2 3 ; ℓ = 0 ... n-1
m_ℓ orientation
$m_\ell = -\ell \ldots \ell$
m_s spin $-\frac{1}{2}, +\frac{1}{2}$

Station 2

1. a) Cl^- $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$

Mg^{2+} $1s^2 2s^2 2p^6$

Al^{3+} $1s^2 2s^2 2p^6$

Tl $1s^2\ 2s^2 2p^6\ 3s^2 3p^6\ 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
$6s^2 4f^{14} 5d^{10} 6p^1$

Fr $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
$6s^2 4f^{14} 5d^{10} 6p^6\ 7s^1$

2 a) $[Xe]$ ~~$6s^2$~~ $4f^{14} 5d^{10}$

b) $[Kr]$ ~~$5s^0$~~ $4d^{10}$

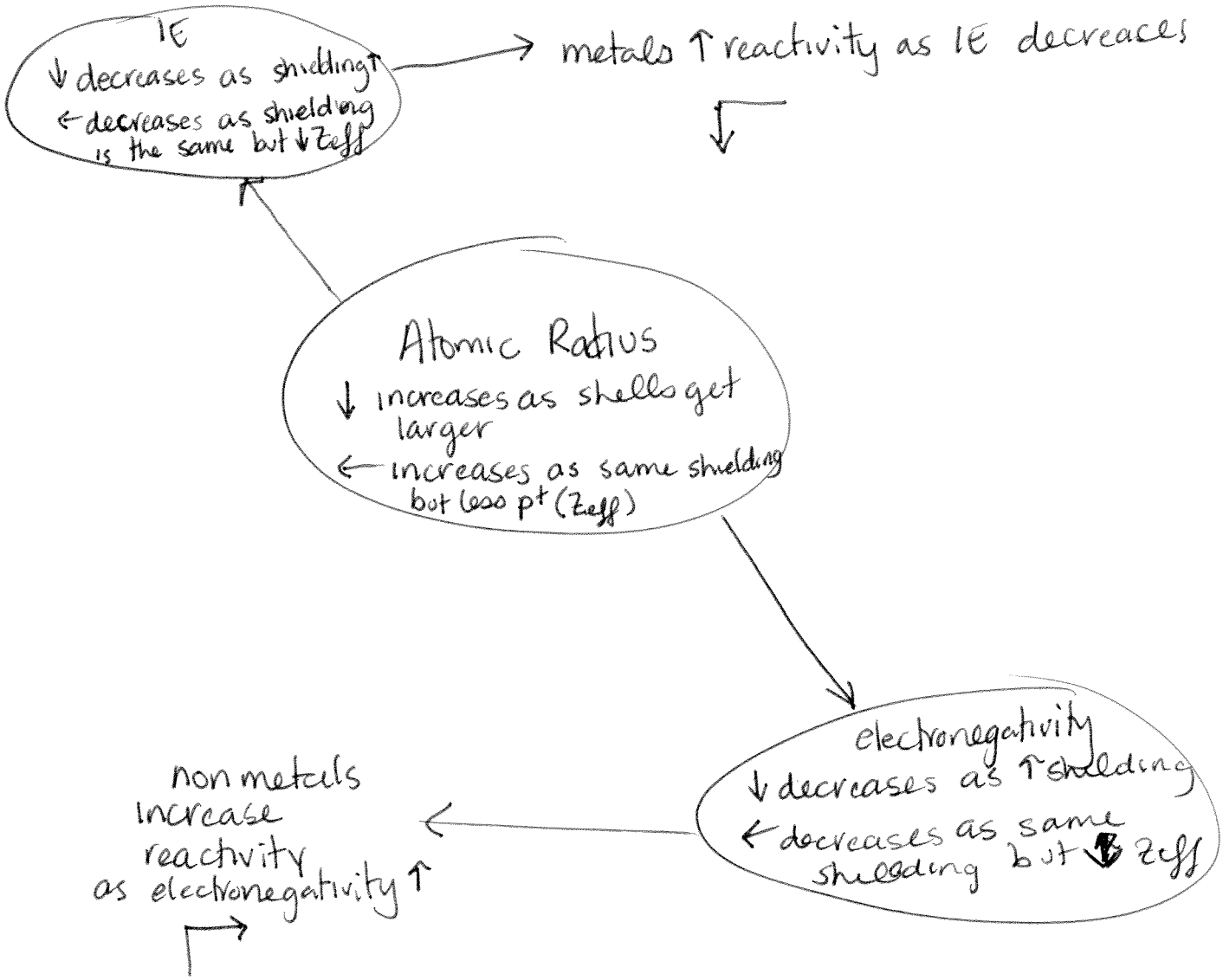
c) $[Ne]\ 3s^2 3p^6$

d) $[Ar]\ 4s^2 3d^{10} 4p^2$

e) $[Ne]\ 3s^2 3p^6$

3. Because they have the same valence electron configuration

Station 3



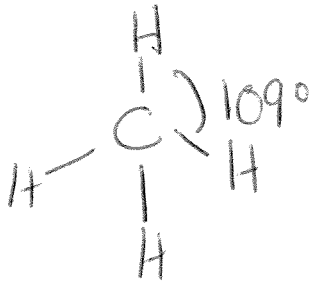
2. Metals tend to lose e⁻ as they have large radii and ↓ IE
Non metals tend to gain e⁻ as they have same radii and ↑ Electronegativity
metalloids can gain or lose as they have moderate IE and electronegativity

Station 4:

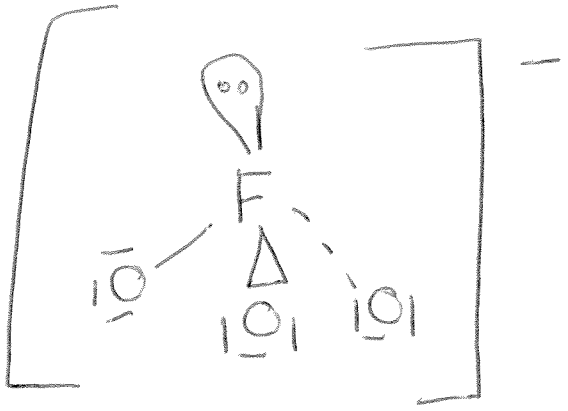
2. ionic - e- transferred
polar covalent - e- shared unevenly
non polar covalent - e- shared evenly

3.

a) 

b) 

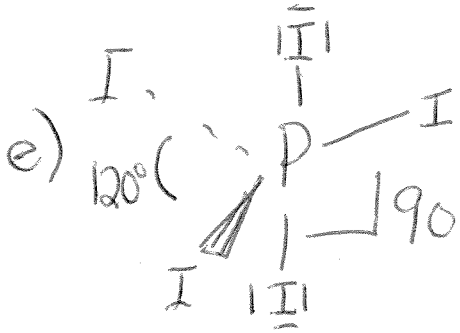
non polar
VDW

c) 

polar
dipole - dipole

d) 

non polar
VDW

e) 

non-polar
VDW