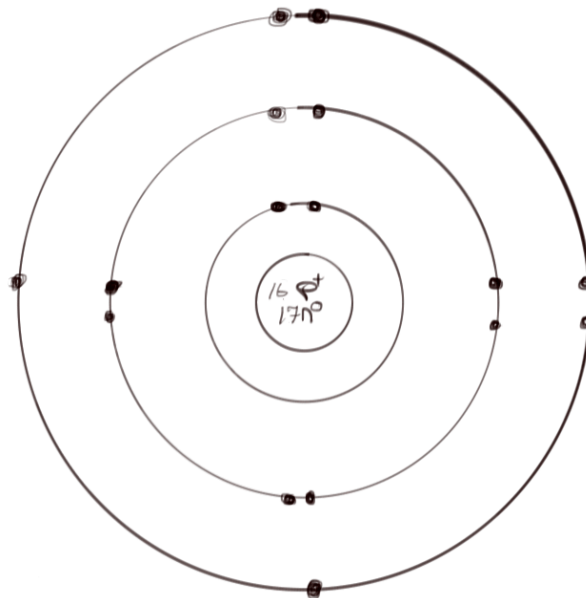
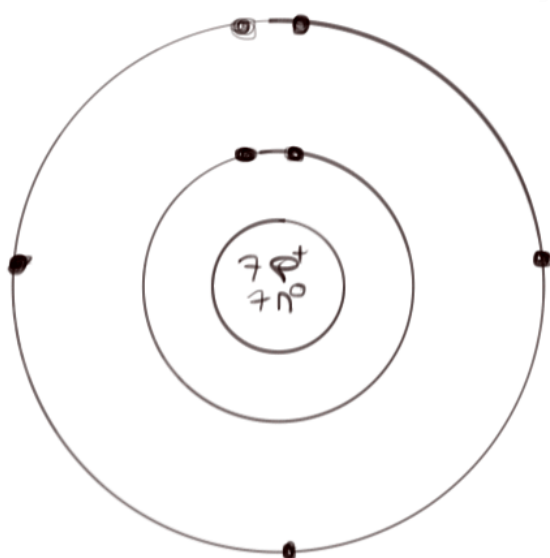


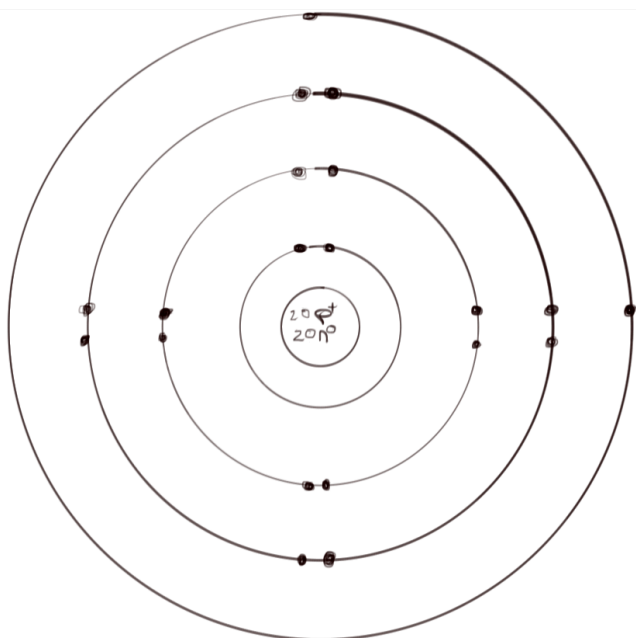
1. $78/97 = 80\%$

Name	Z	A	Number of Protons	Number of Electrons	Number of Neutrons	Nuclide Symbol
Iron	26	58	26	26	32	$^{58}_{26}\text{Fe}$
Lead	82	207	82	82	125	$^{207}_{82}\text{Pb}$
Tin	50	132 122	50	50	72	$^{132}_{50}\text{Sn}$
Xenon	54	131 135	54	54	77 81	$^{135}_{54}\text{Xe}$
Mercury	80	202	80	80	162 122	$^{202}_{80}\text{Hg}$
Barium	56	139	56	56	83	$^{139}_{56}\text{Ba}$

10

2.





9

3. a) i) 1
 ii) 8
 iii) 2
 iv) 9 and 10
 v) 1, 3, and 8
 b) 4, 6, 7, 8, 10

5

2

4. Na, Si, and then C because Carbon has one less valence shell than Silicon causing the Carbon atom to be smaller and Silicon before Sodium because Silicon has more protons than sodium, making the atom smaller.

4

5. F, P, and then N because Fluorine has more valence electrons than Phosphorus meaning that it would take a greater amount of energy for Fluorine to lose an electron than Phosphorus. And Phosphorus is one more period higher than Nitrogen, meaning the Phosphorus has tighter bind on its electrons than Nitrogen, giving Phosphorus a greater need for energy than Nitrogen to ionize.

4

6. F, Cl, and then Al because Fluorine has a smaller atomic radius due to having one less inner shell than Chlorine and can therefore attract electrons easier. Chlorine is greater than Aluminum because Chlorine has less valence electrons than Aluminum.

4

7. Na, Rb, and then Mg. Magnesium is placed last because it's an Alkaline Earth Metal while all the others are Alkali Metals. Sodium comes before Rubidium because Sodium has less inner shells than Rubidium.

The order of reactivity from fastest to lowest is $Rb > Na > Mg$. Magnesium has a larger nuclear charge than sodium so it will have larger ionization energy. Thus it will be less reactive than sodium. For rubidium and sodium, rubidium's electron comes from the fifth energy level, very far away and very weakly held. It will have the lowest ionization energy and will be able to react the fastest.

8. Ionization energy and electronegativity should follow the same trend because they are both dependent on the concept of gaining electrons. While electronegativity refers to the ability to *attract* electrons, electron affinity refers to the ability to *gain* an electron. Because of this, they are both dependent on the electron's distance from the nucleus and the nuclear charge of the atom.

2

9. a) Ionic
 b) Covalent
 c) Ionic
 d) Ionic this is covalent

3

10.
 - i) Ionic reacts more violently than with covalent reactions
 - ii) The electrons are shared in covalent reactions
 - iii) There can be double or triple bonds for covalent reactions

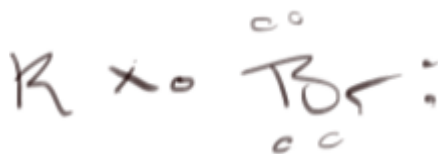
1

Ionic bonds involve electron transfer where as covalent share the electrons

Ionic bonding involves charges ; there are no charges in covalent bonds

Ionic bonding there is metal and nonmetal ; covalent bonding is between two nonmetals only

11. a)



- b)



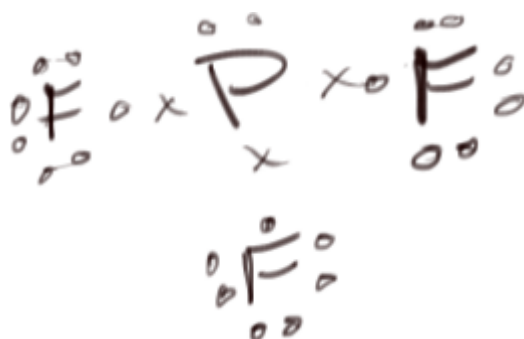
- c)



- d)



e)



f)



g)



KBr, CaCl₂ and Li₂O are basically ionic bonds so please show the charges on each ions. Mention the name of each bonds as well.

10

12. a) Polar



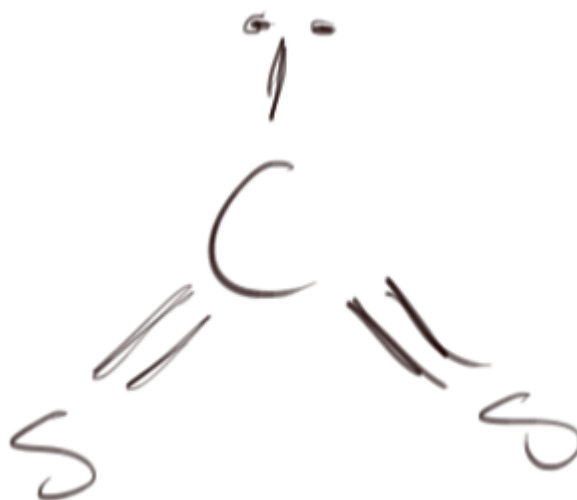
b) Non-Polar



c) Polar



d) Polar



The shape of the structure needs to be mentioned please make sure that you read the question carefully

12

13.

Substance	Polarity	Reason
A	Non-Polar Covalent	Since A is insoluble, it is immediately judged as being a non-polar covalent. The low melting point also helps to confirm this.
B	Polar Covalent	Since B is soluble, it is either ionic or polar covalent. Since the melting point is below room temperature, then therefore it is a polar covalent.
C	Ionic	C is an ionic molecule because of its exceedingly high melting point. The solubility also helps to confirm this.
D	Non-Polar Covalent	Since D is insoluble, it is immediately identified as being a non-polar covalent. The low melting point also helped to confirm this.
E	Polar Covalent	Since the substance was soluble, it was either polar covalent or ionic. The low melting point identified that E is a polar covalent.
F	Ionic	F is an ionic molecule because the substance has a high melting point and it is also soluble.

12