

## Science 10 Chemistry Review - (Chapter 4) Test 1

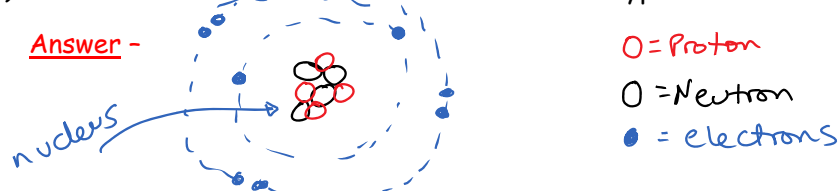
1.) Briefly describe the families, Alkali metals and Alkali Earth metals.

Answer - both are metals, grey relatively soft, and highly reactive. Alkali metals are more reactive, react violently with water, and give up one electron. Alkaline earth metals are less reactive (but still very reactive) and give up two electrons.

2.) Briefly describe the families, Halogens, and Noble gases.

Answer - Halogens are mostly coloured gases with a liquid and one solid at room temperature. Very reactive as they take one electron. Noble gases are all gases and do not react with anything.

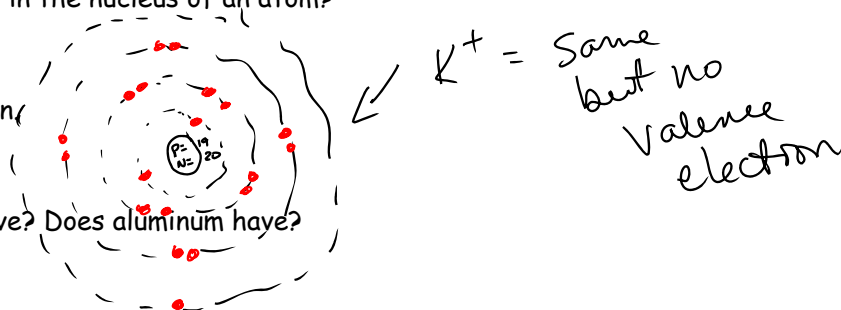
3.) Draw and label an atom. Be sure to include all 3 types of subatomic particles



4.) Which of the following particles are located in the nucleus of an atom?

Answer - protons and neutrons.

5.) Draw a Bohr diagram for a K atom and a K ion.



6.) How many valence electrons does oxygen have? Does aluminum have?

Answer - 2 electrons. 3 electrons.

7.) How many electrons does a neutral atom of Mg have? How many valence electrons does it have?

Answer - 12 electrons. 2 valence electrons.

8.) What happens when an atom forms an ion?

Answer - it loses or gains electrons to be like its nearest noble gas. This causes an imbalance between the protons and electrons.

9.) How many electrons can be found in the each shell, for the first 3 shells, in a Bohr model?

Answer - 2, 8, 8.

10.) What are paired electrons?

Answer - electrons that are not bonding and are found a two electrons together.

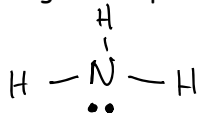
11.) What do the dots in the Lewis diagram represent?

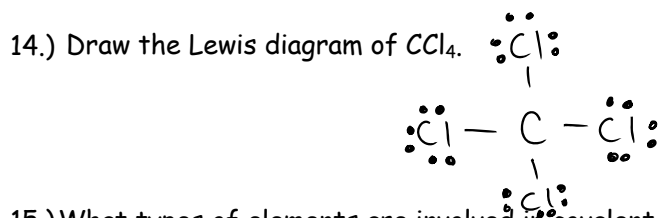
Answer - electrons.

12.) How many bonding pairs and lone pairs of electrons are present in the molecule nitrogen monoxide?

Answer - 2 bonding pairs and 3 lone pair and 1 lone electron (octet rule violator).

13.) Draw the Lewis diagrams represents a molecule of  $NH_3$ .





15.) What types of elements are involved in covalent bonding?

Answer - elements with like electronegativities. (usually non-metals with non-metals)

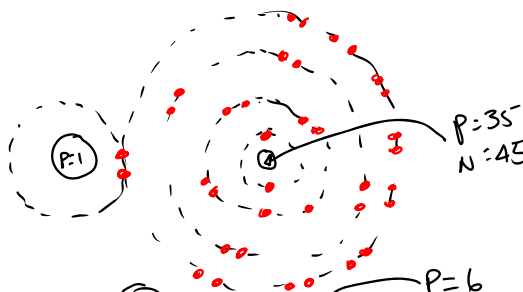
16.) What happens to electrons when a covalent bond is formed?

Answer - the electrons are shared to complete the octets for all of the elements bonding.

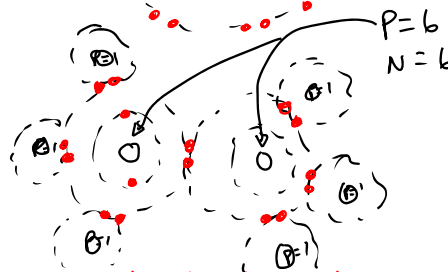
17.) What is a HOFBrINCl?

Answer - an acronym for the diatomic seven elemental molecules (hydrogen, Oxygen, Fluorine, Bromine, Iodine, Nitrogen, and Chlorine).

18.) Draw the Bohr diagram for HBr.



19.) Draw the Bohr diagram for  $\text{C}_2\text{H}_6$ ?



21.) Explain the steps to name an ionic compound.

Answer - 1.) name metal (if multivalent include roman numerals in brackets- 2.) name non-metal. 3.) change ending of non-metal to "ide".

22.) Explain the steps to name a covalent compound.

Answer - 1.) write name of first element with proper prefix to denote the amount of that element (no mono). 2.) write second element name ending in "ide" and using a prefix to denote amount of second element.

23.) How is an ionic compound formed?

Answer - metal gives away electrons to non-metal. This causes the metal to be positively charged and the non-metal to be negatively charged. Opposite charges attract.

24.) List the 10 prefixes used in covalent compounds.

Answer - mon, di, tri, tetra, penta, hexa, hepta, octa, nona, deca.

25.) When do you use a Roman numeral in naming compounds?

Answer - if the metal is multivalent.

26.) How do you tell the difference between an ionic compound and a covalent compound?

Answer - ionic start with metals.

27.) What is a polyatomic ion? What happens when a formula needs more than one of a polyatomic ion?

Answer - an chemical species that is covalently bonded elements (2 or more) with a charge. More than one in a formula needs parentheses around the polyatomic.

28.) What is a subscript?

Answer - a numerical value written below the line on the page to indicate the amount of the preceding element.

29.) Do you always use all prefixes in naming a covalent compound? What is the exception?

Answer - no mono for first element.

30.) Do you leave the ionic charges in the formula for an ionic compound?

Answer - criss cross charges to be subscript amounts of opposite species in the formula.

31.) What does a subscript mean outside of brackets?

Answer - "feed the chickens" (distributive property). The value is applied to each value inside of the brackets.

32.) What is the difference between bonding pairs and lone pairs of electrons?

Answer - bonding pairs are two electrons involved in sticking elements together, while lone pairs are two electrons in the valence shell that are not bonding.

33.) What is the Law of Conservation of Mass?

Answer - mass of reactants equals mass of products in a closed system.

34.) Balance:  $\text{NH}_3 + 2 \text{O}_2 \rightarrow \text{HNO}_3 + \text{H}_2\text{O}$

35.) Balance:  $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$

36.) Balance:  $3 \text{CaO} + \text{P}_2\text{O}_5 \rightarrow \text{Ca}_3(\text{PO}_4)_2$

37.) Balance:  $2 \text{Na} + 2 \text{H}_2\text{O} \rightarrow 2 \text{NaOH} + \text{H}_2$

38.) What does the Law of Conservation of Mass have to do with balancing equations?

Answer - balancing is using coefficients to equalize elements on both sides of the arrow. This is done to make the reactants mass equal to the products mass.

39.) Balance:  $\text{Al}_2(\text{SO}_4)_3 + 3 \text{Ca}(\text{OH})_2 \rightarrow 2 \text{Al}(\text{OH})_3 + 3 \text{CaSO}_4$

40.) Is  $\text{NH}_4\text{Cl}$  ionic or covalent? How do you know?

Answer - Ionic as ammonium is a charged polyatomic ion. Therefore, it is looking to bond with elements or polyatomics with an opposite charge.