

Review Material For Exam I

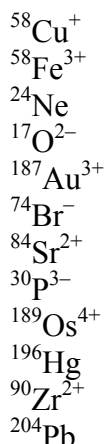
1. Give the IUPAC name of the following substances:

Na₂SO₄
SeF₄
Cl₂O₇
Na₂O
Mn₂O₃
CuCl
Cr₂O₃
ClF₃
BaS
Cu(NO₃)₂
N₂O₅
LiBr
N₂F₂
MgI₂
Al₂(SO₄)₃
CaCO₃
Fe(IO₃)₃·2H₂O

2. Write the chemical formula for the following compounds:

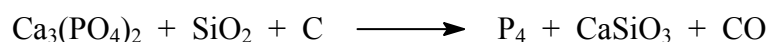
cesium oxide
iron(II) nitrate hexahydrate
copper(I) oxide
dichlorine pentoxide
tin(II) fluoride
lead(II) dichromate
sulfur tetrafluoride
dinitrogen tetrafluoride
bismuth(III) fluoride
xenon tetroxide
mercury(II) sulfate
vanadium(V) oxide
nickel(II) phosphate
ammonium nitrate

3. Give the number of protons, neutrons and electrons for the following:



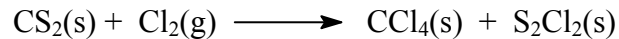
4. Calculate the following:

- number of atoms in 7.46 g of Li
 - number of atoms in 32.0 g of Br_2
 - number of molecules in 43.0 g of NH_3
 - number of molecules in 7.585 g CCl_4
 - number of moles of SO_4^{2-} ions in 14.3 g of $\text{Cr}_2(\text{SO}_4)_3$
 - number of moles of H in 11 g H_3PO_4 .
5. Halothane, CF_3CHBrCl , is an inhalation anesthetic. What are the mass percentages of the elements in halothane?
6. Hydroquinone, used as a photographic developer is 65.4% C, 5.5% H and 29.1% O by weight. Determine the empirical formula.
7. Oxalic acid is a toxic substance used by laundries to remove rust stains. Its composition is 2.20% H, 26.7% C, and 71.1% O by weight. What is the empirical formula? The formula weight is approximately 90 g/mole. What is the molecular formula?
8. Adipic acid is used in the manufacture of nylon. The composition of the acid is 49.3% C, 6.90% H and 43.8% O by weight. What is the empirical formula? The formula weight is approximately 146 g/mole. What is the molecular formula?
9. White phosphorous, P_4 , is prepared by fusing calcium phosphate with carbon and sand (SiO_2) in an electric furnace.



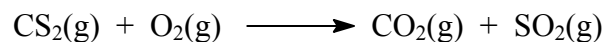
How many grams of calcium phosphate are required to give 5.00 g of phosphorous?

10. The following reaction is used to make carbon tetrachloride



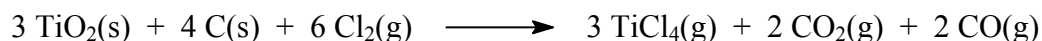
Calculate the number of grams of carbon disulfide needed to react exactly with 62.7 g of chlorine gas.

11. Carbon disulfide burns in oxygen



Calculate the grams of sulfur dioxide produced when a mixture of 15.0 g of carbon disulfide and 35.0 g of oxygen react. What mass (in grams) of the reactant in excess is leftover?

12. Titanium(IV) chloride is obtained from titanium(IV) oxide by the following process:



A vessel contains 4.15 g TiO_2 , 5.67 g C and 6.78 g Cl_2 . How many grams of titanium(IV) chloride can be produced? What mass (in grams) of the reactants in excess are leftover?