Chemical formulas and chemical compounds

Science, Chemistry

Chemical Formulas and Chemical Compounds MIXED REVIEW SHORT ANSWER Answer the following questions in the space provided. 1. Write formulas for the following compounds: CuCO3 a. copper(II) carbonate Na2SO3 b. sodium sulfite (NH4)3PO4 c. ammonium phosphate SnS2 d. tin(IV) sulfide HNO2 e. nitrous acid 2. Write the Stock names for the following compounds: magnesium perchlorate a. Mg(ClO4)2 iron(II) nitrate b. Fe(NO3)2 iron(III) nitrite c. Fe(NO2)3 cobalt(II) oxide d. CoO nitrogen(V) oxide e. dinitrogen pentoxide 3. 13 atoms a. How many atoms are represented by the formula Ca(HSO4)2? 4. 0 mol b. How many moles of oxygen atoms are in a 0. 50 mol sample of this compound? +6 c. Assign the oxidation number to sulfur in the HSO4 _ anion. 4. Assign the oxidation number to the element specified in each of the following: +1 a. hydrogen in H2O2 _1 b. hydrogen in MgH2 0 c. sulfur in S8 +4 d. carbon in (CO3)2_ +6 e. chromium in Na2Cr2O7 +4 f. nitrogen in NO2 5. c, b, d, a Following are samples of four different compounds. Arrange them in order of increasing mass, from smallest to largest. a. 25 g of oxygen gas c. 3 X 1023 molecules of C2H6 b. 1. 00 mol of H2O d. 2 X 1023 molecules of C2H6O2 6. NaOH a. What is the formula for sodium hydroxide? 40. 00 g/mol b. What is the formula mass of sodium hydroxide? 10. g c. What is the mass in grams of 0. 25 mol of sodium hydroxide? 7. 80% C, 20% H What is the percentage composition of ethane gas, C2H6, to the nearest whole number? 8. C5H10O5 Ribose is an important sugar (part of RNA), with a molar mass of 150. 15 g/mol. If its empirical formula is CH2O, what is its molecular formula? 9. Butane gas, C4H10, is often used as a fuel. 174 g a. What is the mass in grams of 3. 00 mol of butane? 1. 81 X 1024 molecules b. How many molecules are present in that

3. 00 mol sample? C2H5 c. What is the empirical formula of the gas? 10. C10H8 Naphthalene is a soft covalent solid that is often used in mothballs. Its molar mass is 128. 18 g/mol and it contains 93. 75% carbon and 6. 25% hydrogen. Determine the molecular formula of napthalene from this data. 11. Nicotine has the formula CxHyNz. To determine its composition, a sample is burned in excess oxygen, producing the following results: 1. 0 mol of CO2 0. 70 mol of H2O 0. 20 mol of NO2 Assume that all the atoms in nicotine are present as products. 1. 0 mol a. Determine the number of moles of carbon present in the products of this combustion. 1. 40 mol b. Determine the number of moles of hydrogen present in the combustion products. 0. 20 mol c. Determine the number of moles of nitrogen present in the combustion products. C5H7N d. Determine the empirical formula of nicotine based on your calculations. 162 g/mol e. In a separate experiment, the molar mass of nicotine is found to be somewhere between 150 and 180 g/mol. Calculate the molar mass of nicotine to the nearest gram. 12. When MgCO3(s) is strongly heated, it produces solid MgO as gaseous CO2 is driven off. 52. 2% a. What is the percentage loss in mass as this reaction occurs? Mg is +2, C is +4, and O is -2 b. Assign the oxidation number to each atom in MgCO3? No c. Does the oxidation number of carbon change upon forming CO2?