

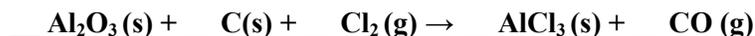
AP Chem
Take Home Exam Ch 1 – 4 &
Reaction Products (40 pts)

Name: _____
I have neither given nor received aid on this exam, except from
my group (if applicable.)
Period: _____ Date: _____

Complete in pencil. Erase mistakes completely. If you need more space, use the back of this sheet as is necessary. For problems involving calculations, **no credit will be given if work is not shown**. Round atomic masses on the Periodic Table to the hundredths place and then perform any calculations. Final answers should include units and be boxed.

1. (16 pts) Provide the name or chemical formula (as needed) for the following compounds. (1 pt each: no partial credit)
- a. $(\text{NH}_4)_2\text{C}_2\text{O}_4$ _____
 - b. HClO_2 _____
 - c. CaSO_3 _____
 - d. AgCN _____
 - e. HgBr_2 _____
 - f. K_2CrO_4 _____
 - g. $\text{Fe}(\text{OH})_2 \cdot 6 \text{H}_2\text{O}$ _____
 - h. I_4O_9 _____
 - i. Sodium monohydrogen phosphate _____
 - j. Cesium hydride _____
 - k. Barium acetate _____
 - l. Nickel (II) nitride _____
 - m. Stannic sulfide _____
 - n. Tetraarsenic decaoxide _____
 - o. Magnesium hydroxide _____
 - p. Aluminum thiocyanate _____
2. (4 pts) Phencyclidine (a.k.a. “angel dust”) is $\text{C}_{17}\text{H}_{25}\text{N}$. A sample picked up in a police drug raid is suspected of being this illicit drug; when tested, the sample was shown to have a percentage composition of 83.71% C, 10.42% H, and 5.61% N. Prove if this sample is phencyclidine. (2 pts work, 1 pt correct answer, 1 pt correct sig figs)

3. (6 pts) Aluminum trichloride is frequently used as a catalyst in industrial processing of hydrocarbons. It also reacts with water to give a solid with an approximate composition of AlOCl that is used extensively in antiperspirants. AlCl_3 can be prepared from the direct reaction of the elements, but is often prepared by an alternative reaction (inconveniently unbalanced as written here):



What mass of AlCl_3 can be prepared from 1.0052 g Al_2O_3 , 0.5483 g C, and 1.794 g Cl_2 if the reaction is 95% efficient? (3 pts work, 1 pt correct limiting reactant, 1 pt correct answer, 1 pt correct sig figs)

4. (8 pts) Water is added to 4.267 grams of UF_6 . The only products are 3.730 grams of a solid (containing only uranium, oxygen and fluorine) and 0.970 gram of a gas. The composition of the gas is 95.0% fluorine and the remainder is hydrogen.
- (2 pts) From these data, determine the empirical formula of the gas.
 - (2 pts) What fraction of the fluorine of the original compound is in the solid and what fraction is in the gas after the reaction?
 - (2 pts) What is the formula of the solid product?
 - (2 pts) Write a balanced equation for the reaction between UF_6 and H_2O . Assume that the empirical formula of the gas is the true formula.
5. (6 pts) Predict the products of the following reactions by writing the net ionic form of the reaction. No balancing is necessary; the physical states do not need to be included. (1 pt each, some partial credit available)
- (1969d) Liquid phosphorus trichloride is poured into a large excess of water.
 - (1969g) Solid sodium carbide is added to an excess of water.
 - (1970a) A mixture of solid calcium oxide and solid tetraphosphorus decaoxide is heated.
 - (1972f) Sulfur dioxide gas is bubbled into an excess of a saturated solution of calcium hydroxide.
 - (1974i) A solution of sodium hydroxide is added to a solution of sodium dihydrogen phosphate until the same number of moles of each compound had been added.
 - (1975h) Dilute nitric acid is added to crystals of pure calcium oxide.