Percent Yield/Percent Error

Name_____
Period_____Date_

Calculate (a) the theoretical yield, (b) percentage yield and (c) experimental error.

1. In preparing a paint pigment of chrome yellow, $PbCrO_4$, a student used 6.94 grams of $Pb(No_3)_2$ (Mol = 323.2). His actual yield of $PbCrO_4$ (Molar Mass = 331.2) was 6.37.

$$Pb(NO_3)_2 + Na_2CrO_4 \rightarrow PbCrO_4 + 2NaNO_3$$

2. Crystals of chrome alum, $KCr(SO_4)_2 \cdot 12H_2O$ (Molar Mass = 499.3), were prepared from 16.2 grams of potassium dichromate, $K_2Cr_2O_7$ (Molar Mass = 294.2), reacting according to the following equation. The a yield was 53.3 grams.

$$K_2Cr_2O_7 + 4H_2SO_4 + 3K_2SO_3 + 20H_2O \rightarrow 2KCr(SO_4)_2 \cdot 12H_2O + 3K_2SO_4$$

3. In preparing the ammonia complex of copper sulfate, $Cu(NH_3)_4 \cdot SO_4 \cdot H_2O$ (Molar Mass = 245.6), by reacting 25.0 grams of $CuSO_4 \cdot 5H_2O$ (Molar Mass = 249.6) with NH_4OH, 22.2 grams of the product were formed.

$$CuSO_4 \cdot 5H_2O \quad 4NH_4OH \rightarrow Cu(NH_3)_4 \cdot SO_4 \cdot H_2O + 8H_2O$$

4. 24.8 g of calcium carbonate can be decomposed by heating to produce 13.1 g of CaO.

$$CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$$

5. 3.74g. of copper is produced when 1.87g. of aluminum is reacted with an excess of copper(II)sulf

$$2Al(s) + 3CuSO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + 3Cu(s)$$

6. 84.8g. of iron(III) oxide reacts with an excess of carbon monoxide and 57.8g. of iron is produce

$$Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(s) + 3O_2(g)$$

7. 50.0g. of silicon dioxide is heated with an excess of carbon to produce 32.2g. of silicon carbide

$$SiO_2(s) + 3C(s) \rightarrow SiC(s) + 2CO(g)$$