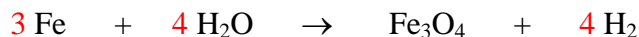


1. Balance the following reaction. (2 pts)



2. An unknown sample contains 27.3 % carbon and 72.7 % oxygen by mass. Determine the empirical formula for this compound. (4 pts)

Assume a 100 g sample:

$$27.3 \text{ g C} \times \frac{\text{mol}}{12 \text{ g}} = 2.28 \text{ mol C} \div 2.28 = 1$$

$$72.7 \text{ g O} \times \frac{\text{mol}}{16 \text{ g}} = 4.54 \text{ mol} \div 2.28 = 2$$

Empirical Formula



3. Calculate the maximum grams of iodic acid ( $\text{HIO}_3$ ) that can be produced if 685 g of iodine trichloride is reacted with 117.4 g of water. (4 pts)



$$685 \text{ g ICl}_3 \times \frac{\text{mol}}{232 \text{ g}} = 2.95 \text{ mol ICl}_3 \quad \longleftarrow \text{Limiting Reagent}$$

$$117.4 \text{ g H}_2\text{O} \times \frac{\text{mol}}{18 \text{ g}} = 6.52 \text{ mol H}_2\text{O}$$

$$2.95 \text{ mol ICl}_3 \times \frac{1 \text{ mol HIO}_3}{2 \text{ mol ICl}_3} \times \frac{176 \text{ g}}{\text{mol}} = 259.6 \text{ g HIO}_3$$