

Add converting between moles, mass and molecules and L.T. 5.2 to your table of contents.

5.2 I can convert between moles, molecules and mass (g) for a given element or compound.

Jan 8-8:11 AM

MUST USE DIMENSIONAL ANALYSIS IN YOUR CALCULATIONS!!!!

A chemical reaction requires 3.43 mole of water. How many grams of water are needed?

$$\frac{3.43 \cancel{\text{mol H}_2\text{O}}}{1} \times \frac{18 \text{ g H}_2\text{O}}{1 \cancel{\text{mol H}_2\text{O}}} = 61.74 \text{ g H}_2\text{O}$$

How many water molecules are in 3.43 grams of water?

$$\frac{3.43 \cancel{\text{g H}_2\text{O}}}{18 \cancel{\text{g H}_2\text{O}}} \times \frac{1 \cancel{\text{mol H}_2\text{O}}}{6.02 \times 10^{23}} = \frac{3.43 (6.02 \times 10^{23})}{18} = 1.15 \times 10^{23} \text{ molecules}$$

how many moles of water are in 2.34×10^{18} molecules of water?

$$\frac{2.34 \times 10^{18}}{6.02 \times 10^{23}} = \frac{(2.34 \times 10^{18})}{(6.02 \times 10^{23})} = 3.89 \times 10^{-6} \text{ mol H}_2\text{O}$$

Jan 8-8:18 AM

$$90.0 \text{ g FeCl}_3 \times \frac{1 \text{ mol FeCl}_3}{162 \text{ g FeCl}_3} \times \frac{6 \text{ mol HCl}}{2 \text{ mol FeCl}_3} \times \frac{36.5 \text{ g HCl}}{1 \text{ mol HCl}} = 60.8 \text{ g HCl}$$

$$52.0 \text{ g H}_2\text{S} \times \frac{1 \text{ mol H}_2\text{S}}{34.1 \text{ g H}_2\text{S}} \times \frac{6 \text{ mol HCl}}{3 \text{ mol H}_2\text{S}} \times \frac{36.5 \text{ g HCl}}{1 \text{ mol HCl}} = 111 \text{ g HCl}$$

Limiting Reactant = FeCl₃

$$90.0 \text{ g FeCl}_3 \times \frac{1 \text{ mol FeCl}_3}{162 \text{ g FeCl}_3} = \frac{6 \text{ mol H}_2\text{S}}{2 \text{ mol FeCl}_3} \times \frac{34.1 \text{ g H}_2\text{S}}{1 \text{ mol H}_2\text{S}} = 28.4 \text{ g H}_2\text{S}_{\text{reacted}}$$

$$52.0 \text{ g H}_2\text{S} - 27.4 \text{ g H}_2\text{S} = 23.6 \text{ g H}_2\text{S excess}$$

Jan 8-9:30 AM