

Name: _____

Date: _____

Molarity and Concentration

What concentration would you get in moles per liter if you dissolved 35.6g of salt (NaCl) in 3 liters of water?

$$\frac{35.6\text{g}}{58.5\text{g/mol}} = 0.609\text{ mol} / 3\text{L} = 0.203\text{ M}$$

What concentration would you get in moles per liter if you dissolved 2.5g of HCL in 0.5 liters of water?

$$\frac{2.5\text{g}}{36.5\text{g/mol}} = 0.0685 / 0.5 = 0.137\text{ M}$$

What concentration would you get in moles per liter if you dissolved 125g of sodium hydroxide (NaOH) in 0.75 liters of water?

$$\frac{125\text{g}}{40\text{g/mol}} = 3.125\text{ mol} / 0.75\text{L} = 4.17\text{ M}$$

What concentration would you get in moles per liter if you dissolved 200g of KOH in 1200 milliliters of water?

$$\frac{200\text{g}}{56.1\text{g/mol}} = 3.57\text{ mol} / 1.2\text{L} = 2.97\text{ M}$$

What concentration would you get in moles per liter if you dissolved 275g of calcium carbonate (CaCO₃) in 400 milliliters of water?

$$\frac{275\text{g}}{100.1\text{g/mol}} = 2.75\text{ mol} / 0.4\text{L} = 6.87\text{ M}$$

What concentration would you get in moles per liter if you dissolved 0.025g of RbClO in 125 milliliters of water?

$$\frac{0.025 \text{ g}}{137 \text{ g/mol}} = 0.00018 \text{ mol} = 1.8 \times 10^{-4} \text{ mol} / 0.125 \text{ li} = 1.46 \times 10^{-3} \text{ M}$$

What concentration would you get in moles per liter if you dissolved 0.333 moles of H₃PO₄ in 750 milliliters of water?

$$\frac{0.333 \text{ moles}}{0.750 \text{ li}} = 0.444 \text{ M}$$

extra $\rightarrow [H^+] = 0.444 \times 3 = 1.332 \text{ M/li}$

What concentration would you get in moles per liter if you dissolved 2.0×10^{-3} g of KOH in 50 milliliters of water?

$$\frac{2.0 \times 10^{-3} \text{ g}}{56.1 \text{ g/mol}} = 0.0357 \times 10^{-3} \text{ mol} = 3.57 \times 10^{-5} \text{ mol} / 0.050 \text{ li} = 7.14 \times 10^{-4} \text{ M}$$

What concentration would you get in moles per liter if you dissolved 6.3×10^{-4} g of HBr in 125 milliliters of water?

$$\frac{6.3 \times 10^{-4} \text{ g}}{80.9 \text{ g/mol}} = 0.0779 \times 10^{-4} \text{ mol} = 7.79 \times 10^{-6} \text{ mol} / 0.125 \text{ li} = 62.32 \times 10^{-6} \text{ M} = 6.23 \times 10^{-5} \text{ M}$$

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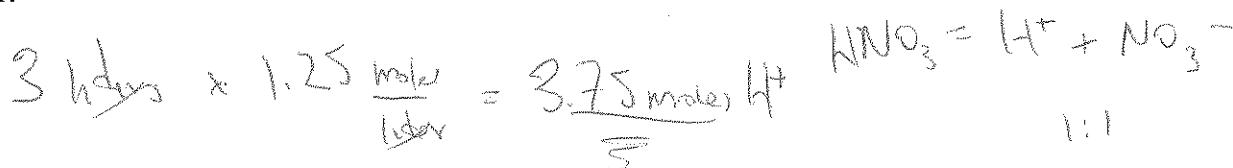
Molarity to Moles and Concentration

How many moles of dissolved H^+ are in 2 liters of 3M hydrochloric acid and water solution?



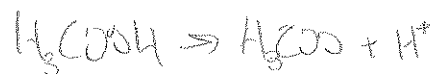
$$2 \text{ liters} \times \frac{3 \text{ moles}}{\text{liter}} = \underline{6 \text{ moles } H^+}$$

How many moles of dissolved H^+ are in 3 liters of 1.25M HNO_3 and water solution?



How many moles of dissolved H^+ are in 0.5 liters of 3M H_3COOH water if this chemical (acetic acid) only gives off one H^+ ?

$$0.5 \text{ liters} \times \frac{3 \text{ moles}}{\text{liter}} = \underline{1.5 \text{ moles } H^+}$$



How many moles of dissolved OH^- are in 0.75 liters of 4M sodium hydroxide ($NaOH$) and water solution?

$$0.75 \text{ liters} \times \frac{4 \text{ moles}}{\text{liter}} = \underline{3 \text{ moles } OH^-}$$

How many moles of dissolved OH^- are in 1200 milliliters of 0.25M KOH and water solution?

$$1.2 \text{ liters} \times \frac{0.25 \text{ moles}}{\text{liter}} = \underline{0.3 \text{ moles}}$$

Neutralized by same moles of $NaOH$ or H^+

