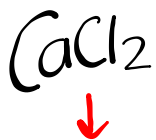# Warm Up
(use whiteboards)

Determine the molar concentration of a solution that contains 47.0 g of $CaCl_2$ dissolved in 550 mL of water.

$C = ?$

$m = 47.0g$

$V = 550 mL$

$CaCl_2$
↓

$(1 \times 40.08) + (2 \times 35.45) = 110.98 \, g/mol$

$C = \dfrac{n}{V}$ $\boxed{0.77 M}$

$C = \dfrac{0.4235 mol}{0.550 L}$

$\boxed{C = 0.77 \, mol/L}$

$47.0g \; CaCl_2 \times \dfrac{1 \, mol \, CaCl_2}{110.98g \, CaCl_2} = 0.4235 mol$

Check Homework

Dilutions

Dilution - process of decreasing the concentration of a solution by adding more solvent (normally water).

Calculating new concentration after a dilution...

Start with 250. mL of a 0.15 mol/L solution. (NaCl)
100. mL of water is added to dilute the solution.

Which quantity is the same before and after the dilution?

- moles of solute (n) ?   Same

- volume of solution (V) ?   ↑

- concentration of solution (C) ?   ↓

$$n_i = n_F$$

$$V_i C_i = V_F C_F$$

$$C = \frac{n}{V}$$

$$n = V \times C$$

$V_i = 250. \, mL$
$C_i = 0.15 \, mol/L$
$V_F = 350. \, mL$
$C_F = \, ?$

$$V_i C_i = V_F C_F$$

$$\frac{(250. \, mL)(0.15 \, mol/L)}{(350. \, mL)} = \frac{(350. \, mL) C_F}{(350. \, mL)}$$

$$C_F = 0.11 \, mol/L$$

Sample Problems

How much 0.20 mol/L glucose solution can be made from
50. mL of 0.50 mol/L glucose solution?

$$V_i C_i = V_F C_F$$

$$V_i = 50.\text{mL}$$
$$C_i = 0.50 \text{ mol/L}$$
$$V_F = ?$$
$$C_F = 0.20 \text{ mol/L}$$

$$\frac{(50.\text{mL})(0.50 \text{ mol/L})}{(0.20 \text{ mol/L})} = \frac{V_F \cancel{(0.20 \text{ mol/L})}}{\cancel{(0.20 \text{ mol/L})}}$$

$$V_F = 125 \text{ mL}$$

$$\boxed{V_F = 130 \text{ mL}}$$

Today's Assignment

Worksheet

p. 484 #12,13
p. 486 #21
p. 499 #52

To Try...

p. 499 #50-55