

4/28 Ch 18 Dilutions!!

Formula

$$M_1 V_1 = M_2 V_2$$

initial final

$$\frac{\text{mol. L}}{L} = \frac{\text{mol. L}}{L}$$

$$\text{mol} = \text{mol}$$

Conc acids ↴

$$\text{HCl} - 12.1 \text{ M}$$

$$\text{H}_2\text{SO}_4 - 18.0 \text{ M}$$

$$\text{HNO}_3 - 15.6 \text{ M}$$

$$\text{HF} - 28.9 \text{ M}$$

You dilute $\frac{25\text{mL}}{V_1}$ of conc HCl M_1 to $\frac{1.0\text{L}}{V_2}$. Find new molarity. M_2

$$(12.1 \text{ M})(25\text{mL}) = M_2 \left(\frac{1000\text{mL}}{1.0\text{L}} \right)$$

$$0.30\text{M} = M_2$$

You need 5.0L of 6.0M HNO₃. How many mL of conc. HNO₃ do you need?

$$(15.6 \text{ M})(V_1) = (6.0 \text{ M})(5.0 \text{ L})$$

$$15.6(V_1) = \frac{30}{15.6}$$

$$V_1 = 1.9 \text{ L} = \boxed{1.9 \times 10^3 \text{ mL}}$$

0.15 M NaCl in 50 mL flask

— g NaCl

You pour 20.0 mL of conc. H_2SO_4 into 150. mL of 2.0 M H_2SO_4 . The final volume equals 167. mL. Find the new molarity.

$$M = \frac{\text{total mol solute}}{\text{total volume}}$$

① Find total mol: $M \cdot L = \text{mol}$

$$(.150 \text{ L}) \left(\frac{2.0 \text{ mol}}{\text{L}} \right) = 0.30 \text{ mol}$$

$$(0.020 \text{ L}) \left(\frac{18.0 \text{ mol}}{\text{L}} \right) = 0.36 \text{ mol}$$

$$+ = \frac{0.66 \text{ mol}}{0.167 \text{ L}}$$

$$\boxed{M = 4.0 \text{ M } \text{H}_2\text{SO}_4}$$

↑
3.95210