

Preliminary Quiz Liquids  
Version A

200g of aluminum fluoride is dissolved in 200mL of water. Answer the following questions.

- a. How many moles of aluminum fluoride are dissolved?

$$\text{AlCl}_3 \left. \begin{array}{l} 27 \\ 35.4(3) \end{array} \right\} 133 \text{ g/mol} \quad \frac{200 \text{ g}}{133 \text{ g}} = 1.5 \text{ mol}$$

- b. What is the dissolving equation for the aluminum fluoride?



- c. What is the concentration in moles/Liter of aluminum fluoride?

$$\frac{1.5 \text{ mol}}{0.200 \text{ L}} = 7.5 \text{ M}$$

- d. How many moles of chloride are present?

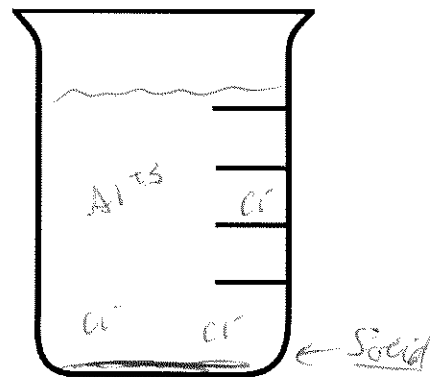
$$1.5 \text{ mol AlCl}_3 \left| \frac{3 \text{ Cl}^-}{1 \text{ AlCl}_3} \right. = 4.5 \text{ mol}$$

- e. What is the molarity of the chloride ion?

$$4.5 / 0.200 \text{ L} = 22.5 \text{ M} \quad (7.5 \times 3 = 22.5)$$

- f. Sketch the solution in the beaker to the right.

a saturated



Preliminary Quiz Liquids  
Version B

50mL of water is added to 25g of NaCl. Answer the following questions.

- a. How many moles of NaCl are dissolved?

$$23 \quad \frac{\text{NaCl}}{58.4} = 58.4 \text{ g/mol} \quad \frac{25 \text{ g}}{58.4 \text{ g}} = 0.42 \text{ mol}$$

- b. What is the dissolving equation for the NaCl?



- c. What is the concentration in moles/Liter?

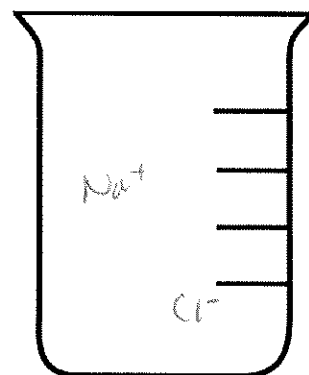
$$\frac{0.42 \text{ mol}}{0.05 \text{ L}} = 8.4 \text{ M}$$

- d. What is the concentration of the NaCl if an additional 30mL of water is added?

$$M_1 V_1 = M_2 V_2 \quad \text{or} \quad \frac{0.42}{0.08 \text{ L}} = 5.25 \text{ M}$$

$$8.4 \cdot 50 = X \cdot 80$$

- e. Sketch the solution in the beaker to the right.



- f. How does the concentration of the sodium ion compare to the chloride ion?

They are equal at 5.25M