

(#7-2c)

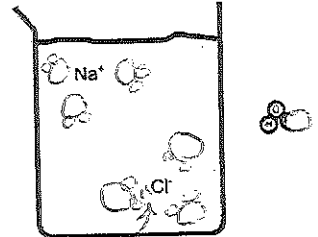
Solution Concentration

1. What factors could a person change in order to make a liquid a solid or a gas?

a) temperature b) pressure

2. Answer the following questions relative to solubility of the beaker →

a. There is 1 example water molecule to the right, add 6 of these to the picture showing correct position to facilitate dissolving?

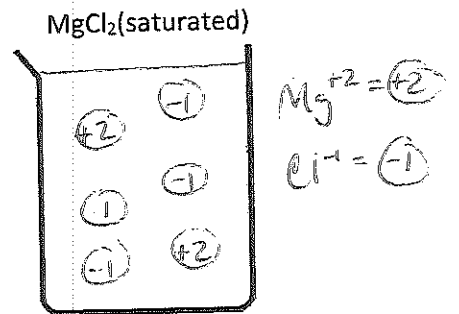
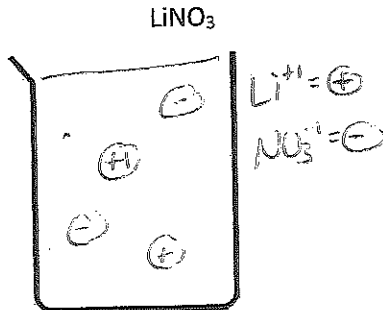
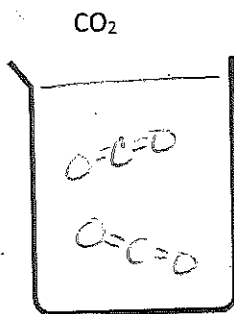


b. What force is causing these to dissolve in water?

ion-dipole

c. Label this force on the picture.

3. Draw a picture in the beakers below of 2 dissolving particles.



4. What is the difference between each substance dissolving relative to bond type?

CO<sub>2</sub> (molecular covalent) does not break apart, Ionic substances break into ions

5. How many Cl<sup>-</sup> ions are floating around in the solution?

4 Cl<sup>-</sup>

6. How many Cl<sup>-</sup> ions would be floating around if 100 MgCl<sub>2</sub> particles were dissolved?

200 Cl<sup>-</sup>

7. 50 grams of MgCl<sub>2</sub> dissolved in 50mL of water

$\begin{matrix} \text{Mg} - 24.3 \\ \text{Cl} - 35.5 \times 2 = 71 \end{matrix} \rightarrow 95.3 \text{g/mol}$

a. How many moles of MgCl<sub>2</sub> are present?

$$\frac{50 \text{g MgCl}_2}{95.3 \text{g/mol}} = 0.5 \text{ mol MgCl}_2$$

b. How many moles of Cl<sup>-</sup> ions are present?

1 mol (twice as much)

c. What is the concentration (M) of the MgCl<sub>2</sub>

$$\frac{0.5 \text{ mol}}{0.05 \text{ L}} = 10 \text{ M MgCl}_2$$

d. What is the concentration (M) of Cl<sup>-</sup> ions?

$$\frac{1 \text{ mol}}{0.05 \text{ L}} = 20 \text{ M Cl}^- \text{ (twice as much)}$$

8. A person adds another 50mL of pure water to the beaker in Question 7?

a. By what factor was the volume increased?

by 2

b. What is the new concentration of the MgCl<sub>2</sub>?

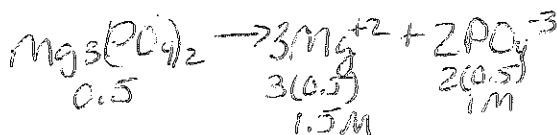
- cut in half

$$\frac{0.5 \text{ mol}}{0.1 \text{ L}} = 5 \text{ M}$$

9. A beaker of 50mL 0.5M Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>. The concentration of Mg<sup>2+</sup> = 1.5M, PO<sub>4</sub><sup>3-</sup> = 1M

10. Additional 50mL of water is added to the solution.

$\text{Mg}^{2+} = 0.75 \text{ M}$   $\text{PO}_4^{3-} = 0.5 \text{ M}$



Volume doubles then conc. cuts in half.