

January 29th

Solubility Equilibrium

Lm 10+11 => due Thursday at 9AM

Test: Feb 6th 7-9 pm.

Quiz

#1) Free ~~Free~~ Energy of pure solvent vs Free energy from solution \rightarrow lower in solution.

#2) lowest = 1.5M $MgCl_2 \rightarrow 3(1.5) = 4.5 > 4, 1.5...$

Poll

1) add solid salt to a saturated solution \Rightarrow concentration will remain the same.

• solubility = units are diff.

= amount of solute that will dissolve given amount of a solution

• molar solubility = $\frac{\# \text{ of moles of solute}}{L \text{ of solution}}$ at given temp.

• equilibrium = off = in.

Poll

2) a tiny bit of the rock ALWAYS dissolves.

equations: don't add water b/c there is no chemical reaction
ex: $CaCl_2(s) \rightarrow Ca^{2+}(aq) + 2Cl^{-}(aq)$

check!
*

• convert into molar:

$$CaCl_2 = 1.435 \text{ g/mL}$$

$$NaCl = 1.199 \text{ g/mL}$$

$$1.435 \frac{\text{g}}{\text{mL}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} \cdot \frac{1 \text{ kg}}{1000 \text{ g}} = \frac{1435 \text{ g}}{\text{L}}$$

$$\text{mmol of } CaCl_2 = 40 + 35.5 + 35.5 = 111 \text{ g/mol} = \boxed{12.9279 \frac{\text{mol}}{\text{L}}}$$

$$\text{mmol of } NaCl = 58.4 \text{ g/mol} = \boxed{20.531 \frac{\text{mol}}{\text{L}}}$$

$$CaCl_2 = 1.435 \frac{\text{g}}{\text{mL}} \quad * \text{ actual } *$$

$$\text{solubility} = \frac{64.7 \text{ g}}{100 \text{ g H}_2\text{O}}$$

$$\frac{64.7 \text{ g } CaCl_2}{164.7 \text{ g solution}} \cdot \frac{1 \text{ mol } CaCl_2}{111.07 \text{ g } CaCl_2} \cdot \frac{1.435 \text{ g solution}}{\text{mL solution}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} = \boxed{5.08 \text{ M}}$$

