


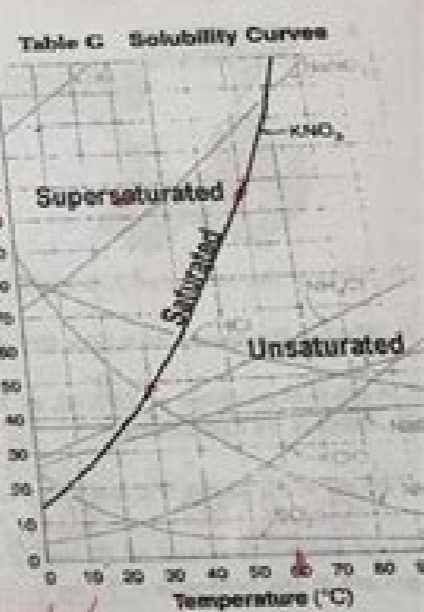
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Day 3 In class review: Reactions → Solubility curves, concentration/dilution, Gas Laws, Equilibrium, Acids and Bases  
 Questions compiled from: <http://www.kentchemistry.com/Worksheets/Regents/RegentsWorksheets.html>  
[http://www.epa.gov/chemistrycenter/WS/Atomic\\_StructureWS/Atomic\\_StructureWS.htm](http://www.epa.gov/chemistrycenter/WS/Atomic_StructureWS/Atomic_StructureWS.htm)

Solutions

1. The compound which is the most soluble at 20°C is KI
2. The compound which is the least soluble at 10°C is KClO<sub>3</sub>
3. The compound which is the least soluble at 80°C is SO<sub>2</sub>
4. The number of grams of potassium nitrate needed to saturate 100 mL of water at 70°C is 130
5. The formulas of the compounds which vary inversely with the temperature are SO<sub>2</sub>, NH<sub>3</sub>, and AgCl
6. A saturated solution of potassium nitrate is prepared at 60°C using 200 mL of water. If the solution is cooled to 30°C, how many grams will precipitate out of the solution? 114g



1. A warm can of soda is dropped and bounces down a flight of stairs. When it is opened, carbon dioxide gas coming out of solution causes it to spray all over. Explain the affect of each of the following:
  - a. The fact that the soda was warm. less gas can be dissolved in warmer liquids.
  - b. The fact that the soda was dropped and bounced down a flight of stairs. Agitation, it mixed it up
  - c. The fact that the can was opened. Release of pressure
2. Sugar is added to a hot cup of coffee and stirred. The sugar dissolves. Explain the affect of each of the following:
  - a. The fact that the coffee was hot. particles move further apart, allow more to dissolve
  - b. The fact that the coffee was stirred. causes the sugar to mix with coffee.
3. Which dissolves faster, a teaspoon of sugar or a sugar cube? Why?  
teaspoon, more surface area
4. What is the concentration of 45 mL of a solution containing 9.0 g of KClO<sub>3</sub>?  

$$M = \frac{m}{V} = \frac{9.0 \text{ g}}{0.045 \text{ L}} = 200 \text{ g/L}$$

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5. What is the molarity of 5.0 L of a solution containing 200. g of dissolved CaCO<sub>3</sub>?  

$$M = \frac{m}{V} = \frac{200 \text{ g}}{5.0 \text{ L}} = 40 \text{ g/L}$$

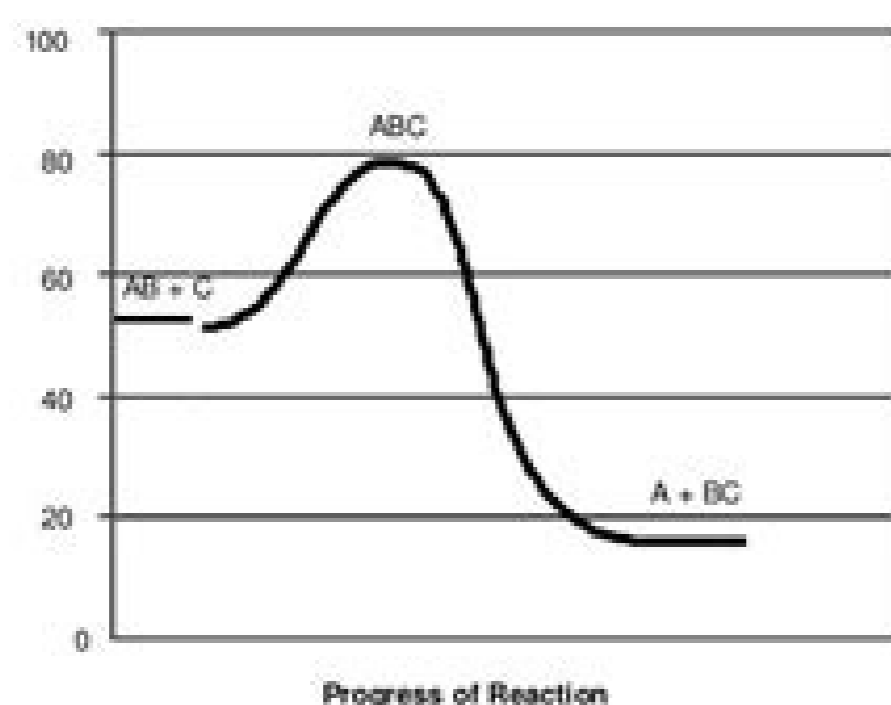
$$M = \frac{m}{V} = \frac{200 \text{ g}}{5.0 \text{ L}} = 40 \text{ g/L}$$
6. A 30mL, 2.M solution is diluted by adding 10 mL of water. What is the final concentration?  

$$M_1 V_1 = M_2 V_2$$

$$(30 \text{ mL})(2 \text{ M}) = M_2 (40 \text{ mL})$$

$$160 = M_2 (40)$$

20. Use the following **Potential Energy Diagram** to answer the questions below:



- a) Determine the **Activation Energy** for the *forward* reaction... \_\_\_\_\_ kJ
- b) Determine the **Activation Energy** for the *reverse* reaction.... \_\_\_\_\_ kJ
- c) What is the **Enthalpy Change** (  $\Delta H$  ) for the *forward* reaction?.. \_\_\_\_\_ kJ
- d) What is the **Enthalpy Change** (  $\Delta H$  ) for the *reverse* reaction?.. \_\_\_\_\_ kJ
- e) The *forward* reaction is \_\_\_\_\_ thermic.
- f) The *reverse* reaction is \_\_\_\_\_ thermic.
- g) Which species or set of species forms the **Activated Complex**? \_\_\_\_\_
- h) Which bond is **stronger**, A-B or B-C? \_\_\_\_\_ Give a reason for your answer. \_\_\_\_\_
- i) Particles from which species or set of species is moving the **fastest**? \_\_\_\_\_  
 State how you arrived at your answer. \_\_\_\_\_

5. Convert 34.7 °C to Kelvin

K = °C + 273  
K = 307.7

6. How much energy does it take to completely melt 42.4 grams of ice?

Q = H · m  
Q = 334 (42.4)  
Q = 14,141.6 J

7. How much energy does it take to completely boil 42.4 grams of water?

Q = H · m  
Q = 2260 (42.4)  
Q = 95,824 J

Atomic Structure

- 1. How does changing the number of protons affect the atom?
2. How does changing the number of electrons affect the atom?
3. How does changing the number of neutrons affect the atom?

changes the atom  
He- determines the charge (Ions)  
He- determines the mass (Isotopes)

Atoms and Ions - Finding P, E, N

Table with columns: Element/Ion, Atomic Number, Atomic Mass, Mass Number, Protons, Neutrons, Electrons. Rows include H, H+, 12C, 13C, 14C, 16O, 17O, 18O, 39K, 40K, 24Mg, As, Ag, Ag+.

Isotopes and Average Atomic Mass

Table with columns: Isotope, % Abundance, Atomic Mass, Mass Number. Includes Nitrogen-14, Nitrogen-15, Oxygen-16, Oxygen-18, Neon-20, Neon-22.

4. Identify the number of Protons, Neutrons, and Electrons in the following:

- a. Phosphorus-33
b. Carbon-14
5. An isotope of phosphorus (phosphorus-32) has a half-life of 320 years. If 5.0 mg of phosphorus-32 disintegrates over a period of 960 years, how many mg of phosphorus-32 would remain?
6. The half-life of U-240 is 1.2 million years. How many years would it take for a 10.0 g sample of U-240 to decay and have only 0.3125 g of it remain?

Day 2 In Class Review - Nuclear Chemistry. Includes questions about radiation types, a diagram of a radioactive source between plates, and a half-life calculation.

Table with columns: Element, Protons, Neutrons, Electrons. Rows include H, He, Li, Be, B, C, N, O, F, Ne, Na, Mg, Al, Si, P, S, Cl, Ar, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Se, Br, Kr, Rb, Sr, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, In, Sn, Sb, Te, I, Xe, Ba, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Po, At, Rn, Fr, Ra, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr.

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