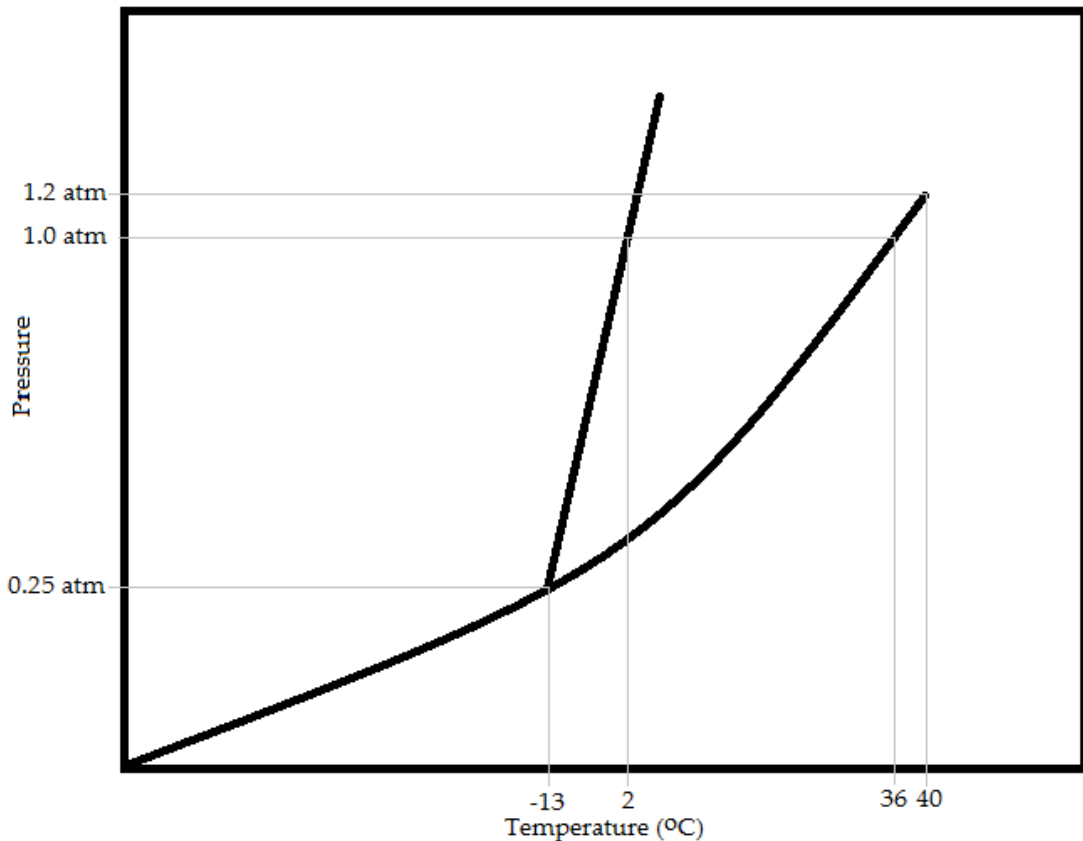


Monday, May 6, 2019

Review for Units 11 & 12 Quiz

Units 11 & 12 Review

Part 1 – Phase Diagrams – Use the phase diagram below to answer the following questions.



1. What are the temperature and pressure at the triple point?
2. What is the critical temperature?
3. What is the normal melting point? Normal boiling point?
4. At 1.0 atm, does this substance undergo sublimation?

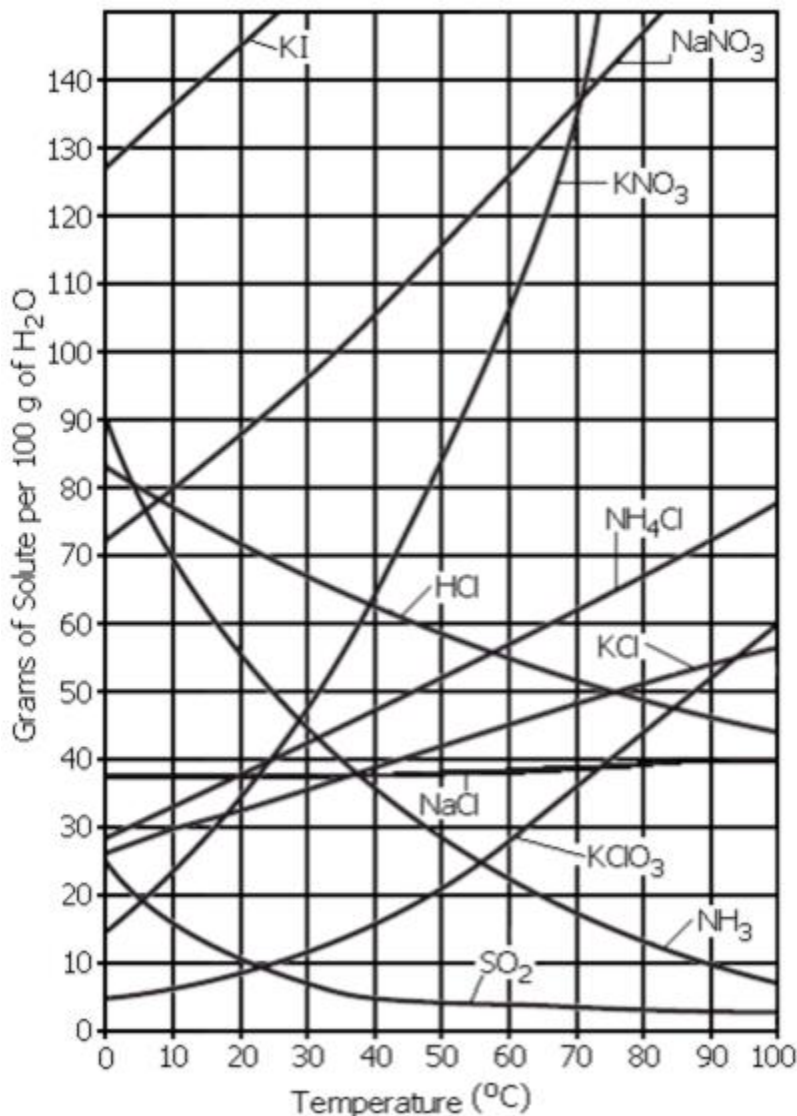
5. Identify the state(s) of matter present at the following conditions:

- | | |
|------------------------|-----------------------|
| (A) 41°C and 1.5 atm | (B) 36°C and 0.25 atm |
| (C) 2°C and 1.0 atm | (D) 11°C and 1.0 atm |
| (E) -50°C and 1.05 atm | (F) 36°C and 1.0 atm |

Part 2 – Heat Calculations – Show your work on a separate sheet of paper. No SF rounding needed in this section!

6. How many Joules of heat are required to boil a 29.3 gram sample of water at 100°C?
7. How many Joules are required to heat a 29.3 gram sample of steam from 100°C to 117.3°C?
8. How many Joules of heat are required to heat a 15.75 gram sample of water from 95.0°C to steam at 117.3°C?
9. What is the mass of a sample of water that requires 1035 J of heat to change its temperature from 35.6°C to 83.5°C?
10. By how many degrees Celsius would 32.8 grams of ice change if 1920 Joules of heat were added to it?

Part 3 – Solubility Curves – Use the graph to answer the questions.



- At what temperature does 135 grams of KI dissolved in 100 grams of water form a saturated solution?
- How many grams of KNO₃ will dissolve in 400 grams of water at 60°C?
- If 10 grams of KClO₃ are dissolved in 100 grams of water at 30°C, is the solution saturated, unsaturated, or supersaturated?
- How many grams of solid precipitate will form if a saturated KCl solution is cooled from 80°C to 20°C?
- A solution contains 35 g of NaNO₃ dissolved in 100 grams of water at 10°C. How many *more* grams of NaNO₃ would need to be added to make a saturated solution?
- How many grams of NH₃ would be able to be dissolved in 300 grams of water at 90°C?

Part 4 – Concentration of Solutions – Solve the following problems on a separate sheet of paper. Be sure to round your answers to the correct # of SFs!

- How many grams of Fe(C₂H₃O₂)₃ are needed to dissolve to make 350. mL of a 2.50 M solution?
- What is the molarity of a solution made by dissolving 49.3 grams of Ba(NO₃)₂ in enough water to make 950. mL of solution?
- What is the molarity of a solution made by diluting 17.3 mL of 12 M hydrochloric acid to 550. mL?
- What volume of 18.0 M H₂SO₄ is needed to be diluted in order to make 550. mL of a 3.75 M solution?

Part 5 – Net Ionic Equations – Determine the solubility of each product. Write the net ionic equation. Determine the spectator ions in the reaction.

- $\text{Ca}(\text{NO}_3)_2 (\text{aq}) + \text{Na}_2\text{CO}_3 (\text{aq}) \rightarrow \text{NaNO}_3 (\quad) + \text{CaCO}_3 (\quad)$
- $\text{Zn}(\text{NO}_3)_2 (\text{aq}) + \text{K}_3\text{PO}_4 (\text{aq}) \rightarrow \text{KNO}_3 (\quad) + \text{Zn}_3(\text{PO}_4)_2 (\quad)$