This print-out should have 10 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001   10.0 points
How many milliliters of 0.010 M HNO_3 will neutralize 20 mL of 0.0050 M $Ba(OH)_2$?

1. 40 mL

2. 20 mL

3. 10 mL

4. 5.0 mL

002   10.0 points
For gases that do not react chemically with water, the solubility of the gas in water generally (decreases, increases) with an increase in the pressure of the gas and (decreases, increases) with increasing temperature.

1. decreases; increases

2. decreases; decreases

3. increases; decreases

4. increases; increases

003   10.0 points
C_6H_{12} will most likely dissolve in which solvent?

1. H_2O

2. $BaCl_2$

3. CCl_4

4. HF

5. NCl_3

004   10.0 points
Several interesting observations from the world around you are listed below. Which of these is NOT explained by a colligative property?

1. A lobster will die when placed in fresh water.

2. At high altitude it takes longer to cook spaghetti.

3. Water boils at a higher temperature when salt is added.

4. The freezing point of water is lowered when salt is added.

5. Antifreeze is added to a car radiator to keep the car from overheating.

005   10.0 points
Consider two liquids A and B. The vapor pressure of pure A (molecular weight = 50 g/mol) is 225 torr at 25°C and the vapor pressure of pure B (molecular weight = 75 g/mol) is 90 torr at the same temperature. What is the total vapor pressure at 25°C of a solution that is 70% A and 30% B by weight?

1. 108 torr

2. 335 torr

3. 195 torr

4. 76 torr

5. 115 torr

6. 124 torr

7. 225 torr

8. 203 torr

9. 135 torr

006   10.0 points
A solution initially contains 1 M Ag^+ and 0.1 M Pb^{2+}. If NaCl is added to the solution, which cation will precipitate first, and

how many orders of magnitude separate the concentrations of Cl^- ions at which the precipitations start?

AgCl: $K_{sp} \approx 10^{-10}$
$PbCl_2$: $K_{sp} \approx 10^{-5}$
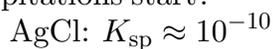
1. Pb^{2+}; 6

2. Both will precipitate at the same time.

3. Ag^+; 8

4. Pb^{2+}; 8

5. Ag^+; 6

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007   10.0 points

In basic solution MnO_4^- oxidizes NO_2^- to NO_3^- and is reduced to MnO_2. Calculate the volume of 0.10 M $KMnO_4$ solution that would be required to oxidize 30 mL of 0.10 M $NaNO_2$.

1. 45 mL

2. 20 mL

3. 10 mL

4. 30 mL

5. 90 mL

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008   10.0 points

Arrange the compounds

I)	CuS	$K_{sp} = 1.3 \times 10^{-36}$
II)	$PbCl_2$	$K_{sp} = 1.6 \times 10^{-5}$
III)	FeS	$K_{sp} = 6.3 \times 10^{-18}$
IV)	Hg_2Cl_2	$K_{sp} = 2.6 \times 10^{-18}$
V)	Cu_2S	$K_{sp} = 2.0 \times 10^{-47}$
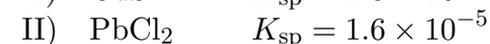
in increasing order of molar solubility.

1. II, IV, III, V, I

2. V, I, IV, III, II

3. I, II, III, IV, V

4. I, V, III, IV, II

5. II, III, IV, I, V

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009   10.0 points

What is the molar solubility of Ag_2S? The K_{sp} is 6.3×10^{-51}.

1. 1.16×10^{-17}

2. 5.8×10^{-18}

3. 6.37×10^{-15}

4. 7.94×10^{-26}

5. 2.82×10^{-13}

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010   10.0 points

What is the molar solubility of CuBr in 0.5 M NaBr? The K_{sp} is 4.2×10^{-8}.

1. 2.05×10^{-4}

2. 3.48×10^{-3}

3. 8.40×10^{-8}

4. 4.20×10^{-7}

5. 4.20×10^{-8}