Mr. Bracken
AP Chemistry

Name _____
Period _____

Molarity Madness #4

1. A beaker containing 180 mL of 0.10 M K_2SO_4 solution is left on the countertop for several days. Due to evaporation, the volume of the solution is reduced to 45 mL. What is the new concentration of the dissolved ions?

$[K^{1+}]$ _____

$[SO_4^{2-}]$ _____

2. Which beaker described below contains the greatest number of moles of Cl^{1-}?

Beaker A: 110 mL of 0.20 M $CaCl_2$

Beaker B: 1.5 grams of solid $AlCl_3 \bullet 6H_2O$ dissolved in 500 mL of tap water

3. A 120 mL sample of 0.10 M $CaCl_2$ solution is added to 50. mL of 0.20 M $AgNO_3$ solution. What are the concentrations of the ions remaining dissolved in solution?

$[Ca^{2+}]$ _____

$[Cl^{1-}]$ _____

$[Ag^{1+}]$ _____

$[NO_3^{1-}]$ _____

4. If 15 grams of $MgSO_4 \bullet 7H_2O$ is mixed with 750 mL of water containing 8.5 grams of K_2SO_4, what are the final concentrations of the ions? Assume the total volume of the system remains constant.

$[Mg^{2+}]$ _____

$[SO_4^{2-}]$ _____

$[K^{1+}]$ _____

5. A 250 mL sample of 0.10 M $Ba(NO_3)_2$ solution is added to 150 mL of 0.20 M Na_2CO_3 solution. What are the final concentrations of the ions that remain dissolved in solution?

$[Ba^{2+}]$ _____

$[NO_3^{1-}]$ _____

$[Na^{1+}]$ _____

$[CO_3^{2-}]$ _____

<u>Hydrolysis Thinker</u>!

6. How many grams of solid NaF should be added to a beaker containing 580 mL of distilled water to produce a solution that has a pH of 8.15? Assume the volume of the solution remains constant.

<u>Buffer Thinker</u>!

7. How many grams of solid $NaC_2H_3O_2$ should be mixed with 150 mL of 0.10 M **H**$C_2H_3O_2$ to produce a buffer solution with a pH of 4.51?

Molarity Madness #4 (Bracken Answers)

1. $[K^{1+}] = 0.80$ M
$[SO_4^{2-}] = 0.40$ M

2. **Beaker A:** 0.044 moles Cl^{1-}
Beaker B: 0.019 moles Cl^{1-}

3. $[Ca^{2+}] = 0.071$ M
$[Cl^{1-}] = 0.082$ M
$[Ag^{1+}] = 0$ M
$[NO_3^{1-}] = 0.059$ M

4. $[Mg^{2+}] = 0.081$ M
$[SO_4^{2-}] = 0.15$ M
$[K^{1+}] = 0.13$ M

5. $[Ba^{2+}] = 0$ M
$[NO_3^{1-}] = 0.13$ M
$[Na^{1+}] = 0.15$ M
$[CO_3^{2-}] = 0.013$ M

6. 3.1 grams NaF

7. 0.71 grams $NaC_2H_3O_2$

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