**Quiz 3**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Identify the Brønsted-Lowry acid, the Brønsted-Lowry base, the conjugate acid, and the conjugate base for the reaction (2 points):

CH3NH2 (aq) + H2O (l) OH- (aq) + CH3NH3+ (aq)

B-L base B-L acid cb ca

1. Calculate the pH and pOH of a solution with [H3O+] = 5.3 × 10-3 M. Indicate if the solution is acidic, basic or neutral (4 points).

The solution is strongly acidic.

1. Complete the following table (4 points):

|  |  |  |
| --- | --- | --- |
|  | Name | Formula |
|  | Oxalic acid | H2C2O4 (aq) |
|  | Nitrous acid | HNO2 (aq) |
|  | Hydroiodic acid | HI (aq) |
|  | Phosphoric acid | H3PO4 (aq) |

1. The value of Kc for the reaction between water vapor and dichlorine monoxide is 0.0900 at 25 °C.
   1. Determine the equilibrium concentration of all three compounds if the starting concentrations of both reactants are 0.00432 M and no HOCl is present (8 points).

H2O (g) + Cl2O (g) ⮀ 2 HOCl (g)

I 0.00432 M 0.00432 M 0 M

C -x -x +2x

E 0.00432 M –x 0.00432 M –x 2x

0.00432 M – 0.000563 M = 0.00376 M 2(0.000563 M) =

0.00376 M 0.00113 M

* 1. How does the concentration of water vapor and dichlorine monoxide change is more HOCl is added?

The concentrations of H2O and Cl2O would increase because the reaction would shift to the left.

1. In the pH Indicators lab, which indicator’s Ka is not determined by visual inspection (2 points)?

Phenolphthalein