pH and pOH Calculations /71

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Please Show ALL of your work!***

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| 1. | Assuming 100% ionization of HCl in dilute solutions, what is the pH of 0.010 M HCl? **(2 marks)** |
| 2. | Determine the [OH-], [H3O+], pOH and pH of a 0.01 mol/L KOH solution. **(4 marks)** |
| 3. | Determine the [OH-], [H3O+], pOH and pH of a 0.045 mol/L HCl solution. **(4 marks)** |
| 4. | What is the [H3O+] of a solution having a pH of 3.4?  **(2 marks)** |
| 5. | If nitric acid is 100% ionized in a 0.0050 M solution, what is the pH of this solution?  Show the equation. **(3 marks)** |
| 6. | A sodium hydroxide solution is prepared by dissolving 6.0 g NaOH in 1.00 L of solution.  Assuming that 100% dissociation occurs, what is the pOH and the pH of this solution?  Show the equation. **(3 marks)** |
| 7. | A solution was made by dissolving 0.837 g Ba(OH)2 in 100 mL final volume.  If Ba(OH)2 is fully broken up into its ions, what is the pOH and the pH of this solution?  **(3 marks)** |
| 8. | A certain brand of beer had a hydrogen ion concentration equal to 1.9 X 10-5 mol/L.  What is the pH of this beer? **(2 marks)** |
| 9. | A soft drink was put on the market hydronium ion concentration of 1.4 X 10-5 mol/L.  What is its pH? **(2 marks)** |
| 10. | Calculate the value of both pH and pOH of the following solutions. **(4 marks)** |
|  | 1. 0.020 M HCl |
|  | 1. 0.0050 M NaOH |
|  | 1. A blood specimen containing 7.2 x 10-8  H3O+mol/L.   Is the blood specimen slightly acidic or slightly basic? |
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| 11. | "Calcareous soil is soil rich in calcium carbonate (lime).  The pH of such soil generally ranges from just over 7 to as high as 8.3. **(3 marks)**  What value of [H3O+] corresponds to a pH of 8.3? Is the soil slightly acidic or slightly basic? |
| 12. | Find the values of [H3O+], pOH and [OH-] that correspond to each of the following values of pH.  **(3 marks each)** |
|  | 1. 2.90 (the approximate pH of lemon juice) |
|  | 1. 3.85 ( the approximate pH of sauerkraut) |
|  | 1. 10.81 (the pH of milk of magnesia) |
|  | 1. 4.11 (the pH of orange juice, on the average) |
|  | 1. 11.61 (the pH of dilute, household ammonia) |
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| 13. | What is the pOH of a 0.010 M NaOH solution? What is the pH of this solution? **(3 marks)** |
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| 14. | Calculate the [H3O+], [OH-], pH and pOH of these solutions;  **(3 marks each)** |
|  | 1. 1.0 M HCl, |
|  | 1. 0.50 M HNO3, |
|  | 1. 0.0020 M HClO4, |
|  | 1. 1.5 X 10-4 M KOH, |
|  | 1. a solution prepared by dissolving 0.040 g NaOH in 2.0 L of solution, **(4 marks)** |
|  | 1. a solution prepared by diluting 1.0 mL of 0.20 M HCl to a total volume of 5.0 L, **(4 marks)** |
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