**Worksheet 4 – pH/pOH**

Complete the chart:

| | $[H^+]$ | $[OH^-]$ | pH | pOH | Acid/base/neutral |
|---|---|---|---|---|---|
| 1. | $7.00 \times 10^{-3}$ M | | | | |
| 2. | | $8.75 \times 10^{-2}$ M | | | |
| 3. | | | 7.33 | | |
| 4. | | | | 4.00 | |
| 5. | | | | | Neutral (2 sig figs) |
| 6. | | | | 10.7 | |
| 7. | | | 2.553 | | |
| 8. | $5.0 \times 10^{-10}$ M | | | | |
| 9. | | $4.7 \times 10^{-10}$ M | | | |

Calculate the $[H^+]$, $[OH^-]$, pH and pOH for a 0.20 M $Ba(OH)_2$ solution.

Calculate the $[H^+]$, $[OH^-]$, pH and pOH for a 0.030 M HCl solution.

Calculate the $[H^+]$, $[OH^-]$, pH and pOH for a 0.20 M NaOH solution.

In the following questions data is given to help calculate the four values of pH, pOH, $[H^+]$ and $[OH^-]$. Please calculate all values not given.

A 0.100 M solution of HCl.

A 0.100 M solution of NaOH.

A 0.00250 M NaOH solution.

A 0.00250 M KOH solution.

A 0.00150 M solution of nitric acid ($HNO_3$).

The pH of a solution of hydrochloric acid is 1.530.

The pOH of a solution of perchloric acid ($HClO_4$) is 13.910.

The pH of a solution of NaOH is 13.900.

The $[OH^-]$ concentration is 0.00100 M.

Calculate [H + ] and $[OH^-]$ in pure water at 25 °C.

What are the pH and pOH for pure water?

A student pipets 50.0 mL of 0.1000 M HCl into a flask and then adds 35.0 mL of 0.2000 M NaOH into the flask. Calculate the pH of the resulting solution.

What is the pOH of the solution when 2.54 g of HCl (g) is added to 5.00 mL of 0.750 M NaOH?

What is the pH when 35.0 mL of 0.450 M $H_2SO_4$ is mixed with 50.0 mL of 0.600 KOH?