pH & pOH

pH & pOH

pH

- determined by the concentration of $[H^+]$ in solution

$$pH = - \log [H^+]$$

Conversely, $[H^+]$ may be determined if pH of a solution is known.

$$[H^+] = 10^{-pH}$$

pH & pOH

pH of water

From the K_w of water @ 25°C (1.0×10^{-14}), we know that [H+] = 1.0×10^{-7}.

Why is the pH of water 7?

Because the log of the above concentration is 7

Q: Is the pH of water always 7? Why or why not?

No. pH is relative to temperature.

pH & pOH

pH & K_w

T (°C)	K_w	pH
0	0.114×10^{-14}	7.47
10	0.293×10^{-14}	7.27
20	0.681×10^{-14}	7.08
25	1.008×10^{-14}	7.00
30	1.471×10^{-14}	6.92
40	2.916×10^{-14}	6.77
50	5.476×10^{-14}	6.63
100	51.3×10^{-14}	6.14

pH & pOH

pOH

Similar to pH, pOH is determined by the concentration of $[OH^-]$ in solution.

$$pOH = - \log [OH^-]$$

$$[OH^-] = 10^{-pOH}$$

If pH @ 25°C is known, how can pOH be determined?

$$pH + pOH = 14$$