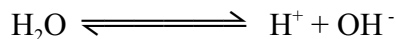


## Summary Table of pH and pOH Relationship

Distilled water is a neutral solution of pH 7.



at pH = 7                       $[\text{H}^+] = 1.0 \times 10^{-7}$                        $[\text{OH}^-] = 1.0 \times 10^{-7}$

Therefore the Ionic Product of Water =  $[\text{H}^+] \times [\text{OH}^-] = 1.0 \times 10^{-14} = \text{a constant} = K_w$  @ 25 °C

pH relates directly to the  $[\text{H}^+]$ :

$$\text{pH} = -\log [\text{H}^+]$$

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

$$\text{pOH} = -\log [\text{OH}^-]$$

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

SOLUTION (aq)	$[\text{H}^+]$ (mol dm <sup>-3</sup> )	$[\text{OH}^-]$ (mol dm <sup>-3</sup> )	pH
0.1 mol dm <sup>-3</sup> HCl			
0.1 mol dm <sup>-3</sup> NaOH			
1.0 x 10 <sup>-2</sup> mol dm <sup>-3</sup> HCl			
1.0 x 10 <sup>-2</sup> mol dm <sup>-3</sup> KOH			
1.0 x 10 <sup>-3</sup> mol dm <sup>-3</sup> HCl			
1.0 x 10 <sup>-3</sup> mol dm <sup>-3</sup> NaOH			
1.0 x 10 <sup>-4</sup> mol dm <sup>-3</sup> HCl			
1.0 x 10 <sup>-4</sup> mol dm <sup>-3</sup> NaOH			
1.0 x 10 <sup>-5</sup> mol dm <sup>-3</sup> HCl			
1.0 x 10 <sup>-5</sup> mol dm <sup>-3</sup> NaOH			
1.0 x 10 <sup>-6</sup> mol dm <sup>-3</sup> HCl			
1.0 x 10 <sup>-6</sup> mol dm <sup>-3</sup> NaOH			

1. 4.00 g of NaOH are dissolved in water to make 1.0 dm<sup>3</sup> of solution.
- b) What is the concentration of the solution in scientific notation ?
- c) What is the  $[\text{OH}^-]$  ?
- d) What is the  $[\text{H}^+]$  ?
- e) What is the pH ?
- f) How could 400 cm<sup>3</sup> of a 0.05 mol dm<sup>-3</sup> solution be made from the above solution?