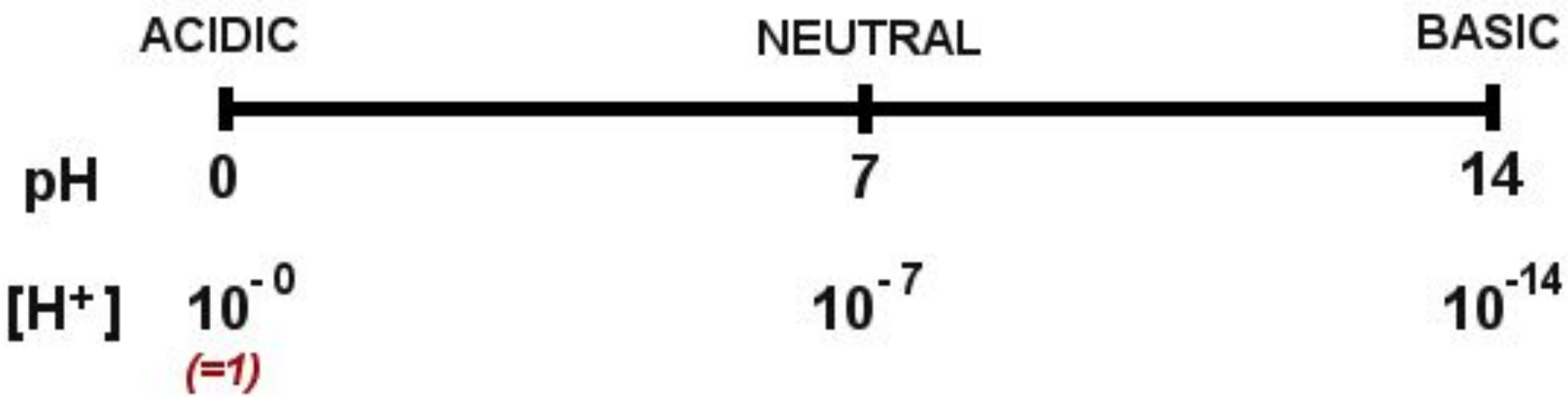
Acid Base Chemistry

1. Foundation knowledge
2. The pH scale
    a. pH of acids, bases, and water
    b. relation between [H+] and pH
        i. intuitive relation
        ii. mathematical relation
    c. $H^+ = H_3O^+ =$ proton
3. The pH of Water
4. Acids
5. Bases
6. Acid base titrations
7. Relative acidity and basicity – competition for H+

pH scale

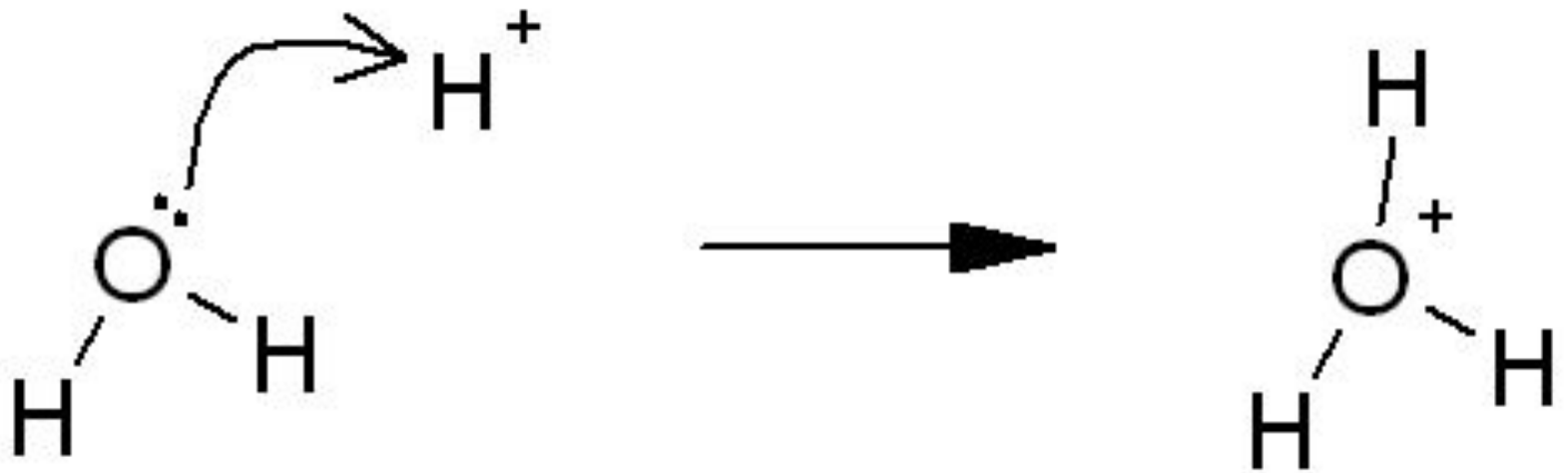


Interconvert pH and $[H^+]$

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

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

$H^+(aq) \longrightarrow H_3O^+(aq) \longrightarrow$ proton



Which of the following is correct? (298K, pK_w =14)

A

pH = 0

$\therefore$ [H+] = 1 $moldm^{-3}$

B

pH = 1

$\therefore$ [H+] = 0 $moldm^{-3}$

C

pH = 1

$\therefore$ [H+] = 1 $moldm^{-3}$

D

pH = 0

$\therefore$ [H+] = 0 $moldm^{-3}$

Which of the following is correct? (298K, pK_w =14)

A

pH = 0

$\therefore$ [H+] = 1 moldm^{-3}

B

pH = 1

$\therefore$ [H+] = 0 moldm^{-3}

C

pH = 1

$\therefore$ [H+] = 1 moldm^{-3}

D

pH = 0

$\therefore$ [H+] = 0 moldm^{-3}

Which pair is correct?

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

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

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

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

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

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

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

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

Which pair is correct?

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

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

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

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

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

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

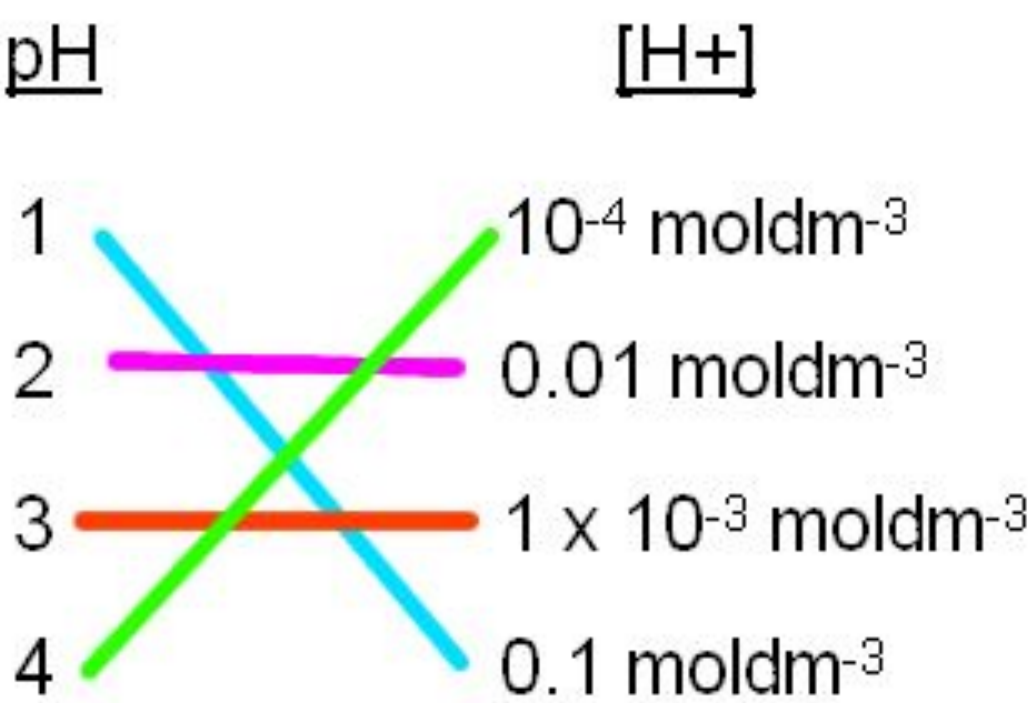
D $pH = \log[H^+]$

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

Match the pH to the H^+ concentration

pH	[H+]
1	10^{-4} moldm^{-3}
2	0.01 moldm^{-3}
3	1×10^{-3} moldm^{-3}
4	0.1 moldm^{-3}

Match the pH to the H^+ concentration



Match the H^+ concentration to the pH

[H+]	pH
1×10^{1} moldm^{-3}	10
1×10^{-1} moldm^{-3}	0
1×10^{-10} moldm^{-3}	1
1 moldm^{-3}	-1

Match the H^+ concentration to the pH

[H+]	pH
1×10^{1} moldm^{-3}	10
1×10^{-1} moldm^{-3}	0
1×10^{-10} moldm^{-3}	1
1 moldm^{-3}	-1