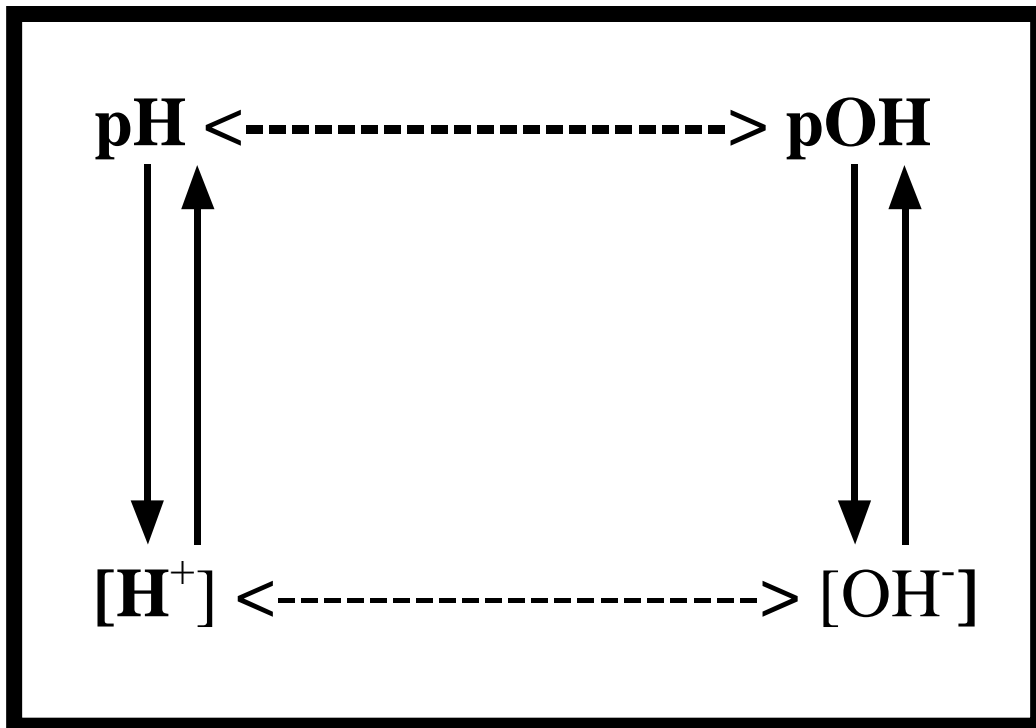


Changing from pH or pOH to concentrations

MINI-TUTORIAL Std 5

This little insight may be helpful to you when you convert pH or pOH to their respective ion concentrations . Think of a big box. The rule is, you can only convert vertically or horizontally. You **cannot convert diagonally**. Here are the conversions and the box:



Horizontal Conversions

Going from $[H^+] \longleftrightarrow [OH^-]$

$$\frac{1 \times 10^{-14}}{[H^+]} = [OH^-] \quad \text{or} \quad \frac{1 \times 10^{-14}}{[OH^-]} = [H^+]$$

Going from $pH \longleftrightarrow pOH$ (remember $pH + pOH = 14$)

$$14 - pH = pOH$$
$$14 - pOH = pH$$

Vertical Conversions

Going from $[H^+]$ -----> pH or $[OH^-]$ -----> pOH

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

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

Going from pH -----> $[H^+]$ or pOH -----> $[OH^-]$

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

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

This is a great little box to have on your help sheet !!!

Another HOT item for your help sheet is “estimating the pH” below:

To figure out the pH from the $[H^+]$, you normally must figure out the $-\log [H^+]$.

With this chart you can make a fairly accurate guess on the pH value to be sure you ran your calculator properly. Also, in many multiple choice questions you can find the right answer without even using your calculator.

$[H^+]$	Value of pH	$[OH^-]$	Value of pOH
1×10^x	(x)	1×10^x	(x)
2×10^x	(x-1) .70	2×10^x	(x-1) .70
3×10^x	(x-1) .52	3×10^x	(x-1) .52
4×10^x	(x-1) .40	4×10^x	(x-1) .40
5×10^x	(x-1) .30	5×10^x	(x-1) .30
6×10^x	(x-1) .22	6×10^x	(x-1) .22
7×10^x	(x-1) .15	7×10^x	(x-1) .15
8×10^x	(x-1) .10	8×10^x	(x-1) .10
9×10^x	(x-1) .05	9×10^x	(x-1) .05
10×10^x	(x-1)	10×10^x	(x-1)

*** Note that pH and pOH are the same values as numbers but that they mean very different things!**