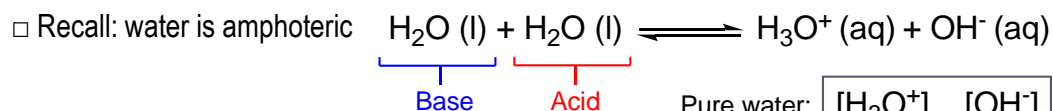


## CONCEPT: AUTO-IONIZATION

- **Auto-ionization** occurs when \_\_\_\_\_ molecules react with one another in an aqueous solution.



- **K<sub>w</sub>**: ionization \_\_\_\_\_ of water:

K <sub>w</sub> Formula	
$K_w = \frac{\text{products}}{\text{reactants}} = \underline{\hspace{2cm}}$	$K_w = 1.0 \times 10^{-14}$ at 25° C <b>pH + pOH = 14</b>

- As temperature \_\_\_\_\_, K<sub>w</sub> \_\_\_\_\_

K <sub>w</sub> & Temperature	
T (°C)	K <sub>w</sub>
0	1.14 x 10 <sup>-15</sup>
10	2.93 x 10 <sup>-15</sup>
20	6.81 x 10 <sup>-15</sup>
30	1.471 x 10 <sup>-14</sup>
50	5.476 x 10 <sup>-14</sup>
100	51.3 x 10 <sup>-14</sup>

**EXAMPLE:** A particular aqueous solution at 50°C contains 3.7 x 10<sup>-4</sup> M of hydronium ions. Calculate the [OH<sup>-</sup>] and identify solution as acidic, basic, or neutral.

**PRACTICE:** Chemistry student prepared an aqueous solution at 30°C. If the solutions contains 7.42 x 10<sup>-9</sup> M of hydroxide ions, calculate the pH.

**PRACTICE:** Calculate the K<sub>w</sub> of pure water given the pH = 6.34.