**Calculating [OH-]from Kw and [H3O+] and the pH scale.**

 **Previously we emphasized that the value of Kw = 1.0 x 10-14 only at 25 C.**

 **This is because Kw, like all equilibrium constants, is affected by temperature and the H3O+ and OH- concentrations in neutral aqueous solutions at temperatures other than 25 C will change from 1.0 x 10-7.**

 **Unless otherwise indicated, we will always assume a temperature of 25 C.**

 **The concentration of H3O+ ions in a sample of lemon juice is 2.5 x 10-3 M.**

 **Calculate the concentration of OH- ions and classify the solution as acidic, neutral or basic.**

 **When [H3O+] is known, the OH- concentration can be found from the expression:**

 **[OH-] = Kw / [H3O+].**

 **Solution:**

**[OH-] = Kw / [H3O] = 1.0 x 10-14 / 2.5 x 10-3=**

 **4.0 x 10 -12 M**

 **Because [H3O+] > [OH-], the solution is acidic.**

 **Because the product of the H3O+ and OH- concentration must equal 10-14 and because the H3O+ concentration is in the range 10-3 M to 10-2 M, the OH- concentration must be in the range of 10-11 M to 10-12.**