**Hydrated Protons and Hydronium Ions**

 **The transfer of the proton is important for both the Arrhenius and the Bronsted – Lowry definitions of an acid.**

**HA (aq) H+ (aq) + A- (aq)**

 **As a bare proton, the positively charged H+ ion is too reactive to exist in an aqueous solution.**

 **Because of it’s reactivity the H+ ion bonds to the oxygen atom of a solvent water molecule to give the trigonal pyramidal hydronium ion H3O+ .**



 **The H3O + ion, which can be regarded as the simplest hydrate of the Proton H(H2O) + , can associate through hydrogen bonding with additional water molecules, to give higher hydrates with the general formula H(H2O)n +  (n = 2,3 or 4).**

 **Examples: H5O2+, H7O3+ and H9O4+.**

 **It’s likely that aqueous acidic solutions contain a distribution of H(H2O)n + ions having different values of n (subscript outside the oxygen).**

 **The abbreviations H+ (aq) and H3O+ (aq) can be used to mean the same thing:**

 **A proton hydrated by an unspecified number of water molecules.**