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dissociates. the value
for

Sociology, Identity



The purpose of this lab was to determine the the pKa value for ionization of two unknown weak acids using acid-base titrations. An acid-base titration is a procedure used to determine the concentration of an acid or base by using a measured volume of an acid or base of known concentration and reacting it with a sample to their equivalence point. The equivalence point is the point of titration where the amount of titrant added is enough to completely neutralize the analyte solution. A neutralization reaction is a type of chemical reaction in which a strong acid and strong base react with each other to form water and a salt. Half-neutralizations were done on weak acids to create solutions with equal molar amounts to the acids and their conjugate bases. At the half-neutralization point, $HA = A^-$.

The pH values were measured and used in pKa calculations for the unknowns in order to determine their identity. According to the modern Brønsted-Lowry definition, an acid is defined as any species that is capable of donating a proton. Acids can be categorized as strong or weak based off their strength and its equilibrium constant (K_a) value. An equilibrium constant is the ratio of the concentration of the products to the concentration of a reactant. A weak acid is partially dissociated into ions in an aqueous solution or water, while a strong acid fully dissociates. The value for K_a of a strong acid is very large, while the K_a for weak acids are much less than one. As an acid dissolves in water, hydrogen ions are donated to water molecules, forming H_3O^+ ions. A conjugate acid is a species formed by receiving a hydrogen from a base, while a conjugate base is a species formed by the removal of a proton from an acid.

Another category of acids are polyprotic acids, which contain more than one ionizable hydrogen. The ionization of these acids occur in a series of steps, each having its own K_a value.