

Weak Acid–Strong Base Titrations

Consider the neutralization reaction between acetic acid (a weak acid) and sodium hydroxide (a strong base):



This equation can be simplified to



How can one use the equilibria below to show mathematically by using equilibrium constants that the reaction between OH^- and the weak acid goes only to the right?

$$[\text{OH}^-][\text{H}^+] = 10^{-14} \quad K_a = \frac{[\text{A}^-][\text{H}^+]}{[\text{HA}]}$$

If there are any other equilibrium constant needed in addition to prove this please use them and explain them