Answer to Question #39038, Chemistry, Organic Chemistry

Question

OH^- (From KOH) vs $C_2H_5O^-$ (C_2H_5OH) Which is More strong?

Answer

Strength of the base can be considered as its affinity to proton.
Consider the equilibrium

$B^- + H^+ = BH$,

where B^- denotes the base. More stronger base will have higher value of the equilibrium constant. The latter is about 10^{14} for water:

$$OH^- + H^+ \xleftrightarrow{K} H_2O$$

$$K = \frac{[H_2O]}{[OH^-][H^+]} = 10^{14}\, mol^2 l^{-2},$$

and about 10^{16} for ethanol

$$C_2H_5O^- + H^+ \xleftrightarrow{K} C_2H_5OH$$

$$K = \frac{[C_2H_5OH]}{[C_2H_5O^-][H^+]} = 10^{16}\, mol^2 l^{-2},$$

(two orders higher), hence $C_2H_5O^-$ is a stronger base.