Titration Curves

Weak Base   +   Strong Acid

0.1 M NH_3 0.1 M HCl

25.0 mL   20.0 mL

2.5×10^{-3} mol   − 2.0×10^{-3} mol $= 5.0 \times 10^{-4}$ mol

V =   25 + 20 mL

$NH_3 + H_2O \rightleftharpoons NH_4^+ + OH^-$

$x = 4.5 \times 10^{-6}$ pOH = 5.35
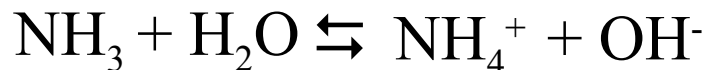
pH = 8.65

$K_b = 1.8 \times 10^{-5} = \dfrac{[NH_4^+][OH^-]}{[NH_3]}$

$[NH_3]$	$[NH_4+]$	$[OH^-]$
0.011	0.044	0.0
0.011 −x	0.044 + x	x

$1.8 \times 10^{-5} = \dfrac{[x]\;[0.044 + x]}{[0.011 - x]}$

pH

10.0

5.0

0   10   20   30   40   50

volume HCl added (mL)