Quiz 3 **Name:**
Fall 2003
Chem 311

0.345 ml of concentrated HCl (12.1 M) is added to 100.00 ml of a 0.1025 M solution of ammonia. Calculate the pH of this solution.

$Ka(NH_4^+) = 5.70*10^{-10}$

Initial moles of NH_3 = (0.1025 mmol/ml)*(100.00 ml) = 10.25 mmol NH_3

Mol H^+ added = (0.345 ml)*(12.1 mmol/ml) = 4.1745 mmol H^+

$NH_3 + H^+ \rightarrow NH_4^+$

At equilibrium

Mol NH_3 = 10.25 - 4.1745 = 6.0755 mmol

Mol NH_4^+ = 4.1745 mmol

Thus, this is a buffer!!!!

pH = -log(ka) + log(6.0755/4.1745) = 9.244 + 0.162978 = 9.406978 = 9.407