Answer on Question #76321 - Chemistry - General Chemistry
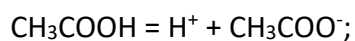
Question:

Exactly 100 ml of 0.15 M acetic acid (HC2H3O2,Ka = 1.8x 10^-5) are titrated with a 0.20 M NaOH solution. Calculate the pH for (a) the initial solution (the HC2H3O2), (b) the point at which 37.5 ml of the base has been added, (c) the equivalence point (d) after adding 80.0 ml of 0.20 M NaOH

Solution:

a) $n(CH_3COOH) = C*V = 0.15 * 0.1 = 0.015$ mol.

$CH_3COOH = H^+ + CH_3COO^-$;

$Ka = [H^+]*[CH_3COO^-]/[CH_3COOH]$

$1.8*10^{-5} = x^2/0.15$;

$x = sqrt(1.8*10^{-5} * 0.15) = 0.0016$

$[H^+] = 0.0016$ mol;

pH = 2.8