



6.) When titrating benzoic acid ( $C_6H_5COOH$ ) it requires 28.4 mL of 0.125 M NaOH. The initial pH of the acid was 2.628 and the pH at the halfway point is 4.191.

a.) What is  $K_a$  for benzoic acid?

b.) What is the starting concentration of the acid?

7.) A solution of 25.0 mL  $C_3H_4N_2$  (imidazole) has a pH of 10.104. This solution is titrated with 36.8 mL of 0.0986 M HCl. The pH at halfway to the equivalence point is 7.047.

a.) What is the  $K_b$  of the imidazole?

b.) What is the [imidazole] when calculated from the [HCl] and the volumes of HCl and imidazole?

c.) What is the [imidazole] when calculated from the  $K_b$  and the initial pH?