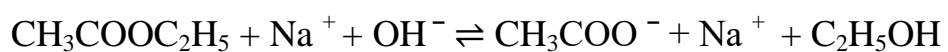


Experiment (5)

Determine the rate constants of the hydrolysis of ethyl acetate by sodium hydroxide

This experiment illustrates a bimolecular reaction for which a second – order rate constant can be calculated:



The reaction species are ethyl acetate the hydroxyl ion .

$$K t = \frac{x}{a(a-x)} , \quad t^{1/2} = \frac{1}{Ka}$$

Requirements

Burette

(0.02M) ethyl acetate

(0.02M) sodium hydroxide

(0.01M) hydrochloric acid

(0.01M) sodium hydroxide

phenolphthalein indicator

Procedure

- 1- Add 50ml from (0.02M) ethyl acetate to 50 ml (0.02M) sodium hydroxide. Shake thoroughly and note the time.
- 2- Directly withdraw 5ml sample and discharge as rapidly as possible into 10ml (0.01M) hydrochloric acid and titrate the excess acid with the standard (0.01M) sodium hydroxide using phenolphthalein indicator.
- 3- Take samples and treat in the same manner after 5, 10, 20, 30, 40.50.60 minute.