

2020
B.Sc. Part-III Hons (1+1+1, -09 & New) Practical Examination
University of Calcutta
CHEMISTRY
Paper VIII B, Module 35b
F.M. 50

FAKIR CHAND COLLEGE CENTRE (551)

[Use A4 pages and black ink only for writing answers. Write Roll number and Registration number at the top and page number at the bottom in each page. In graph paper, put your Signature in addition to the Roll number. Images of indexes of your LNB, self-signed graph paper, answer scripts and admit card must be in a single pdf file.]

1. Exp: “Determination of the rate constant of saponification of methyl acetate using a conductivity meter”

- a) Write down the theory for covering the following point. [4+1]
i) The chemical reaction, order of the reaction, integrated rate equation for reactions of that order with explanation of all the terms appearing; unit of k.
ii) Working formula without derivation.
- b) The following conductance data were measured at different time for the saponification experiment using (M/60) NaOH and (M/60) methyl acetate at 28 °C.

Time (min: sec)	Conductance, C_t (ms)	Time (min: sec)	Conductance, C_t (ms)
1:00	1.98	6:38	1.63
1:56	1.90	8:02	1.58
2:44	1.84	9:35	1.53
3:35	1.79	11:19	1.49
4:30	1.73	13:36	1.43
5:32	1.67	16:25	1.37

The C_0 and C_∞ values were **2.2 ms** and **0.94 ms** respectively. Represent the data in suitable tabular form. [2]

- c) Calculate the required parameters for plotting (12 pairs) and the rate constant. [6+1]
d) Plot $(C_0 - C_t) / (C_t - C_\infty)$ versus time (12 data points) to obtain the rate constant of the reaction at 28 °C. [7+1+3]
- 2. LNB / Internal Assessment** (Attach images of the signed indexes of your LNB) [15]
- 3. Give the answers of the following questions.** [5×2=10]

- a) A liquid is flowing from left to right. On which direction is the viscous force acting on it?
b) Name two factors on which the molar absorbance depend?
c) Write down the Nernst equation at 30°C temperature for the potentiometric titration of AgNO₃ with KCl.
d) State how the order of ester hydrolysis reaction can be changed by changing pH of the medium.
e) Name a system which has only lower consolute temperature.