

2021
B.A./B.Sc. Semester IV Honours Examination
University of Calcutta
CHEMISTRY
Paper: CC 9P
PRACTICAL
F.M. 30

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 of each page. Scan the current admit card and upload in a single pdf file along with the answer script]

1. Write briefly the theory for the experiment named, Using a polarimeter, determine the rate constant for the acid catalyzed inversion of sucrose using the supplied catalyst solutions at room temperature, covering the following points.

- (i) Inversion of optical rotation for sucrose on hydrolysis.
- (ii) Order of the reaction in the given experimental condition. Nature of catalysis.
- (iii) Deduction of working equation starting from the basic integrated rate equation, with explanation of the terms that appear. 2+3+5 = 10

2. Answer all the questions briefly:

2×10 = 20

- a) The partition co-efficient of I_2 between CCl_4 and water is 85. If 2 g of iodine is added to a mixture of 1:5 (v/v) CCl_4 & water, which solvent will contain more iodine? Calculate the relative ratio of I_2 in them.
- b) Name one example of each pair of solution for which i) only lower consolute temperature is obtained and ii) only upper consolute temperature is obtained
- c) Calculate the degrees of freedom i) inside the phase boundary and ii) outside the phase boundary of phenol-water system.
- d) 10 ml (N/100) HCl is diluted to 100 ml in a volumetric flask with water, calculate the pH of the resulting solution.
- e) Why using ordinary glass electrode, we cannot directly measure the pK_3 value of H_3PO_4 ?
- f) Write the cell representation of a glass electrode. Mention the inner solution present.
- g) What is plane polarized light?
- h) Explain if there is any role of ionic strength (addition of electrolyte, e. g. KCl) in the kinetics of inversion of cane sugar experiment?
- i) Write the expression of pH for NH_4Cl solution and CH_3COONa solution.
- j) Can the following solution be considered as buffer? Explain briefly.

2ml 0.1(N) NaOH + 10 ml 0.1(N) oxalic acid