



# EASERN UNIVERSITY, SRI LANKA

SECOND EXAMINATION IN SCIENCE 2012/2013 (March/ April 2016)

FIRST SEMESTER

CH 202 ANALYTICAL CHEMISTRY

Answers all questions

Time: One hour

(a) Explain the principle involved in the solvent extraction.

(15 Marks)

(b)  $V$  ml of aqueous solution ( $V_{aq}$ ) which contains  $A_0$  mol of solute X is brought into contact with  $V$  ml of immiscible organic solvents ( $V_{org}$ ). At equilibrium  $A_1$  mol of solute X remains in the aqueous layer.

Show that

$$A_1 = \frac{A_0 V_{aq}}{V_{aq} + V_{org} K}$$

Where  $K$  is Partition Coefficient of the solute of X between organic layer and aqueous layer

(25 Marks)

(c) Give the equation for the number of moles of solute X remaining after 'n' extraction

(10 Marks)

(P. T. O)

(d)

Distribution coefficient of the solute X between the organic layer and aqueous layer is 10. A 50.0 ml of  $0.125 \text{ mol l}^{-1}$  aqueous solution of X was extracted with 20.0 ml of organic solvent. How many times should it be extracted to reduce the concentration of X in aqueous to  $0.005 \text{ mol l}^{-1}$ ?

(e) Briefly discuss the applications of solvent extractions in industries.

2.

(a) "Atomic Absorption Spectroscopy is a spectroanalytical procedure for the quantitative determination of chemical elements using the absorption of radiation by free atoms in the gaseous state". Explain this statement.

(b) Briefly describe the Atomic Absorption Spectroscopy by using a labelled diagram. Write the function/s of each basic component of this Spectroscopy.

(c) Briefly describe the Paper Chromatography and explain the different types of Paper Chromatography with suitable diagrams.

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