

IN NUTSHELL

This Ph.D. thesis in “NutShell” contains the following:

- (i) Exhaustive experimental data on **“Quaternary Liquid-Liquid Phase Equilibria Data”** for mixed solvents-(Dmf+W) & (Dmso+W) involving aromatics-B/T/X and aliphatics-H/H'/O under different sets of conditions.
- (ii) Also exhaustive mass transfer data on **“Liquid Liquid extraction of aromatics”** in a packed column using mixed solvents-(Dmf+W) & (Dmso+W) under different sets of conditions.
- (iii) Inclusive of different variations-totally **45 systems involving solvent-(Dmf+W) and also 45 systems involving solvent-Dmso+W** have been utilized to obtain values of distribution capacity, selectivity and distribution coefficients. All values have been analyzed critically w.r.t. effect of parameters-temperature, antisolvent concentration, molecular weight of aliphatics and molecular weight of aromatics.
- (iv) All the quaternary liquid tie line data can be correlated satisfactorily by modified Hand's correlation. *satisfactorily.* **The values of Hand's constants (k & n)** have also been analyzed critically w.r.t. effect of parameters – temperature, antisolvent concentration, molecular weight of aliphatics and aromatics.
- (v) The generalized **Oza-Puranik (O-P) correlation** proposed in this investigation can be considered as one of the most important and **unique contribution** of the present work.
- (vi) The values of NRTL constants obtained in this investigation could also be utilized conveniently to predict the values of extract phase as well as raffinate phase compositions.
- (vii) The values of **% holdup of dispersed phase, % aromatic extracted and % purity of extract** have been obtained under different sets of conditions for both mixed solvents-(Dmf+W) & (Dmso+W). The values of **mass transfer rates, NTU, HTU, Koc • a, Kod • a** have been also obtained and all mass transfer aspects have been evaluated critically.
- (viii) “Mass transfer data obtained for liquid-liquid extraction of aromatics by **carrying out operation in a multistage manner**” can also be considered as one of the most important contribution of this research work.
- (ix) Obtaining limiting **values of %AE and %PE for multi component liquid extraction** of aromatics **performed in a multi stage** manner involves exhaustive “Thermodynamic Calculations”, wherein information available is scanty. Hence, data presented in this regard can be considered as second **unique feature** of this investigation.
- (x) Packed bed liquid liquid extraction column/columns for liquid liquid extraction of aromatics can be designed conveniently **using the data presented in this investigation.**