Contribution to the extraction of furfural from fermentation broth by studying phase equilibria: ELV (furfural+ ethyloctanoate); LLE (furfural+water) and LLE (furfural+water+ethyloctanoate)

Biobutanol and other biochemicals derived from lignocellulosic biomass fermentation coproduces many different byproducts among which furfural. This aldehyde is known to be inhibitory to the fermentation process and consequently reduce the efficiency of the biofuel production. The extraction of furfural from the aqueous solution is therefore necessary. The most viable method is liquid–liquid extraction (comparing to distillation, economically not recommended) whose development need experimental phase equilibrium data. In this work, low concentrations of furfural in aqueous solutions are studied. The selected extraction solvent is ethyloctanoate, non-toxic solvent used in the food industry and in perfumery as a flavoring. The determined phase equilibria are: liquid-vapor equilibria of (furfural+ ethyloctanoate), liquid-liquid equilibria of the binary system (furfural+water) and the ternary system (furfural+water+ethyloctanoate). The obtained data were correlated by UNIQUAC equation.