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Abstract: Liquid-liquid phase equilibria for ternary systems of water + (ethanol / 1-propanol) + 1-decyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide ([Dmim][NTf_2]) were measured at T = 298.15 K and atmospheric pressure. Influences of alcohols with different length of alkyl chain on the liquid-liquid equilibria were revealed by the distribution coefficient and selectivity of the alcohols. The phase diagrams for the ternary systems were classified as Treybal's Type I behavior. The experimental data of ternary liquid-liquid equilibria were correlated by the nonrandom two liquid (NRTL) and the universal quasi-chemical (UNIQUAC) models, in which the interaction parameters were optimized. The values of root-mean-square deviation between the experimental and the calculated data show that those models can correlate the experimental data of the studied systems with good accuracy.

Keywords: Liquid-liquid equilibrium; Alcohol; Ionic liquids; NRTL; UNIQUAC