

## **New Class of Self-Buffering Ionic Liquid and Its Application for Separation of 1,3-Dioxolane from its Azeotropic Aqueous Solution**

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In this work we synthesized a new self-buffering and biocompatible ionic liquid, in which anion was derived from a commonly used biological Good buffer (GB), 4-(2-hydroxyethyl)-1-piperazinepropanesulfonic acid (EPPS) and cation was contributed from tetramethylammonium (TMA). The buffering action of this new synthesized Good buffer ionic liquid (GBIL) is confirmed by measuring its pH profile in aqueous solution. Moreover, the pKa values of the GBIL in water were determined experimentally at 293.2 K, 298.15 K and 308.15 K. It was also found that the presence of this new GBIL, [TMA][EPPS], in 1,3-dioxolane aqueous solution could induce liquid-liquid phase splitting. The influence of this new GBIL on the separation of 1,3-dioxolane from its aqueous solution has been investigated by measuring solid-liquid-liquid equilibrium (SLL) and liquid-liquid equilibrium (LLE) data for the 1,3-dioxolane + water + GBIL system under atmospheric pressure and at 298.2 K. The experimental LLE tie-line data were correlated well with the NRTL model and their consistency has been confirmed by correlating the LLE tie-line data with the Othmer-Tobias equation. The experimental results also indicated that this new GBIL can be used as an attractive auxiliary agent to recover high purity 1,3-dioxolane from its azeotropic solution. A greener separation process is proposed in the present study. In comparison with the conventional inorganic salts, this new GBIL is a biocompatible, non-corrosive, and green compound.