

### Liquid-liquid equilibrium study for use of a green and cheap ionic liquid to purify gasoline octane booster

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In spite of numerous governmental and institutional policies looking for a more controlled and rational consumption of energy, forecasts prognosticate a continuation of the raising trend in the near future, closely related to the global population growth. The environmental contamination from auto exhausts will therefore more serious.

MTBE benefits air quality by making gasoline burn cleaner, thus reducing automobile emissions. But it can also find its way into groundwater supplies and give drinking water an unpleasant taste and odor. It is the reason why some substitutes of MTBE are studied. So, we studied therefore the phase equilibria and mixture properties systematically for new gasoline additive, Di-isopropyl ether (DIPE). In present work, we report the liquid-liquid equilibrium (LLE) data at 298.15 K for the ternary systems of DIPE (1) + ethanol (2) + IL (3), DIPE (1) + methanol (2) + IL (3) and DIPE (1) + water (2) + IL (3). Ionic liquids are 1-Butyl-3-methylimidazolium tetrafluoroborate ([BMIM][BF<sub>4</sub>]) and 1-ethyl-3-methylimidazolium ethyl sulfate ([EMISE]). The experimental ternary LLE data were correlated with the NRTL and UNIQUAC activity coefficient models.