



Trihexyl (tetradecyl) phosphonium bis (trifluoromethylsulfonyl) amide as promising extractant for extractive desulfurization from liquid fuels

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ABSTRACT

Nowadays there are serious regulations to eliminate sulfur from fuels because the SOX created through the combustion of fuel containing sulfur compounds which causes air pollution and have hazardous environmental influence. Amongst numerous extractants, Ionic Liquids (ILs) are capable enough to extract sulfur due to their desirable green properties. This work demonstrated that trihexyl(tetradecyl)phosphonium bis(trifluoromethylsulfonyl) amide (CyphosIL-109) was presented as promising extractant for EDS of Dibenzothiophene (DBT), thiophene, benzothiophene and other alkyl substituted derivatives of sulfur from liquid fuel. The FTIR, NMR, UV, Raman and TG/DSC spectra have been discussed for the molecular purity confirmations and thermal stability. Further, physical properties of CyphosIL-109 were carried out. Effects of time, temperature, sulfur compounds, ultra-sonication and recycling/regeneration on DBT removal from fuel were also examined. In EDS, the DBT removal in n-dodecane was 83.1% with mass ratio (1:1) in 30 min at 30 °C. CyphosIL-109 might be reclaimed six cycles without a substantial S-reduction. Also, S-removal from real fuel and multistage extraction performance was tested. The experimental data and results provided in this article discover the remarkable understandings of phosphonium ionic liquids as promising solvent for EDS.

Biography

Swapnil Dharaskar has completed his PhD from VNIT, Nagpur, India and Postdoctoral studies from Department of Green Chemistry, Lappeenranta University of Technology, Finland. He is

the Head of Chemical Engineering, School of Technology, Pandit Deendayal Petroleum University, Gandhinagar. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute. He is the Life Member of IChE, ISTE, SPE, ISRD, IAENG, etc.