

(54) Title of the invention : TRIPHENYL TETRADECYL PHOSPHONIUM BROMIDE AS A PROMISING CATALYST/EXTRACTANT FOR ULTRASOUND - ASSISTED EXTRACTIVE/OXIDATIVE DESULFURIZATION OF A BASE OIL.

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(57) Abstract :

The titled invention Triphenyl tetradecyl phosphonium bromide as a promising catalyst/extractant for ultrasound-assisted extractive/oxidative discloses the method that the Triphenyl tetradecyl phosphonium bromide ([TPTDPJ]Br) is synthesized using triphenylphosphine and 1-bromotetradecane as raw materials. The synthesized ionic liquid is characterized using Fourier-Transformed Infra-Red, Nuclear Magnetic Resonance, Thermogravimetric Analysis, and Differential Scanning Calorimeter. The synthesized IL is used as an extractant/catalyst during the ultrasound-assisted extractive/oxidative desulfurization (UEODS) process. The UEODS process was applied to the model oil as well as actual base oil samples. The conditions optimized for the dibenzothiophene (DBT) containing model oil were 17.5 min, 50 °C with 2g of IL, and 12/1 molar ratio of oxidant to sulfur and obtained 98.96% desulfurization efficiency. The kinetic study of the DBT oxidation reaction was carried out to examine the reaction kinetics. The recyclability of [TPTDPJ]Br was performed and found that this IL can be reused up to 10 cycles with a slight change in activity. To check the industrial applicability, the desulfurization of actual base oil was carried out and obtained less than 10 ppm sulfur content after three UEODS cycles.

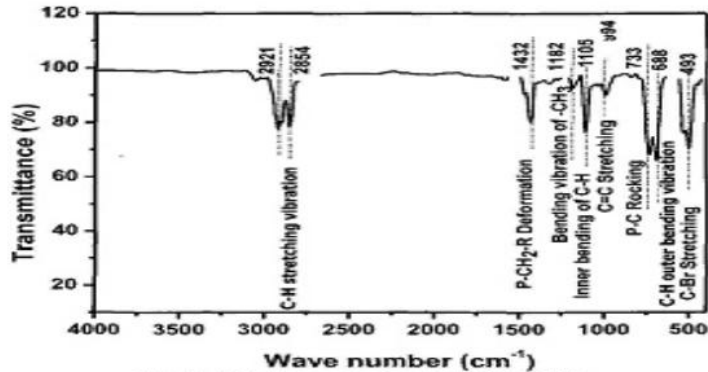


Fig 1. FT-IR analysis of [TPTDP]Br

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