STUDY OF BOUNDARY LUBRICATING ADDITIVES USING ELECTROCHEMICAL TECHNIQUES

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Keywords: tribology, additive, electrochemistry

ABSTRACT

An important component in the armoire of the researcher of chemical behavior in aqueous systems is the group of electrochemical techniques such as cyclic voltammetry, impedance spectroscopy etc., which enables redox reactions to be monitored and controlled. It would be of great value if these techniques could be applied to formulated lubricant systems in order to study and control the reaction of boundary and other lubricant additives. The main problem in applying electrochemistry to study lubricants is, of course, the very low electrical conductivity of most hydrocarbon-based fluids.

The current paper describes the development and application of a series of supporting electrolytes based on tetraalkylammonium-tetraphenylborates for hydrocarbons, which make possible conventional electrochemistry in liquid hydrocarbons. These additives are used in a range of base fluids to investigate some of the reaction chemistry and film-forming properties of boundary lubricant additives.