

Compatibility of ionic liquids with hydraulic system components

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ABSTRACT

The aim of this work was to identify, which of the known ionic liquids used within the technical area, primarily as a lubricant, would also be appropriate for use as a hydraulic fluid. In this context, their suitability has been proved based on experimental research with respect to the appropriate physical and chemical properties as required for mineral based hydraulic fluid. Primary aim of the research was to determine the ability of ILs to protect against corrosion, which is one of the important factors in choosing an ionic liquid. The results show that, despite excellent lubricating properties, certain ILs fail on this corrosion test. Except the corrosion protection performance of the basic hydraulic components parts, e.g. hydraulic pumps and valves, in the foreground was their compatibility with other materials used within other parts of hydraulic system, e.g. coating of the hydraulic tank and the filter material. For this purpose standard tests methods for mineral based hydraulic oils have been used, supplemented with non-standard tests, carried out at the same conditions as they occur during the operation of the hydraulic system.

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