

Ionic Liquids Containing Protic or Symmetric Aprotic Ammonium Cations and Phosphinate Anions as Lubricant Additives

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Technology Summary

A lubricant additive is an ionic liquid ammonium salt. The quaternary ammonium cation of the ionic liquid is either protic ($[NR_3H]^+$) or symmetric aprotic ($[NR_4]^+$) having four identical hydrocarbon groups. The anion of the ionic liquid is organophosphinate $[P(O)2(R)2]^-$, wherein R is independently a hydrocarbon group having ≥ 4 carbon atoms. The ionic liquid may be used as an ashless additive in lubricating oils, such as anti-wear, friction modifier, and corrosion inhibitor. Potential applications include internal combustion engines, gears, bearings, axles, hydraulic systems, metal cutting and forming, and other manufacturing processes.

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