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Harrup

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- (54) **ALL-INORGANIC SOLVENTS FOR ELECTROLYTES**
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(57) **ABSTRACT**

An all-inorganic electrolyte formulation for use in a lithium ion battery system comprising at least one of each a phosphoranimine, a phosphazene, a monomeric organophosphate and a supporting lithium salt. The electrolyte preferably has a melting point below 0° C., and a vapor pressure of combustible components at 60.6° C. sufficiently low to not produce a combustible mixture in air, e.g., less than 40 mmHg at 30° C. The phosphoranimine, phosphazene, and monomeric phosphorus compound preferably do not have any direct halogen-phosphorus bonds. A solid electrolyte interface layer formed by the electrolyte with an electrode is preferably thermally stable ≥80° C.