Diquaternary ammonium energetic ionic liquids for chemical propulsion system

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Previous hydrazine and its derivatives have been considered as a *state of art* chemical propulsion in aerospace field. However, an extreme care is necessary for hydrazine due to it high toxicity and also a high vapor pressure. To overcome it, environmentally friendly and stable chemical propellant has been explored. Highly energetic ionic liquid is a promising candidate because of its low vapor pressure. Dicyanamide anion based diquaternary ammonium ionic liquids, 1,1'-(butane-1,4-diyl)bis(1-methylpyrrolidin-1-ium) and hexamethylpropane-1,3-diaminium were synthesized following the simple quaternization reaction and subsequent ion exchange method. Ignition delay test of those ionic liquids have been measured using concentrated nitric acid as an oxidant.