

Ionic liquids under applied fields at interfaces and under confinement: Forces, friction and tribotronics.

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Ionic liquids have received much attention as tribological additives and lubricants, due to their tuneability but also due to the possibility of controlling the surface composition using an applied field. Nonetheless, much work remains to understand the interfacial properties of these liquids and their corresponding frictional behavior. Of particular interest are ionic liquids with orthoborate based anions, which avoid the issue of fluorination – however relatively little is known about their properties otherwise.

Quartz crystal microbalance, Vibrational sum frequency spectroscopy and neutron reflectance have been applied at isolated interfaces, whereas confined properties have been studied using AFM and Surface Forces (ATLAS). In both cases applied electric fields are applied and the electroresponsiveness measured. The role of water is also addressed, and found to be important in this context. A brief summary of conclusions will be presented.

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