

O 101: Overview Talk: Hans-Peter Steinrück

Time: Friday 13:15–14:00

Location: S054

Invited Talk

O 101.1 Fri 13:15 S054

Ionic liquid surface science — •HANS-PETER STEINRÜCK —
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Ionic liquids (ILs) are molten salts with a melting point below 100 °C. They represent a new class of liquid materials with unique property profiles originating from a complex interplay of Coulombic, hydrogen bonding, and van der Waals interactions of their ions. The enormous variety of cation-anion combinations enables tuning of the physico-chemical properties over a wide range. Functional groups can be implemented in their chemical structure to adapt them for specific tasks - such functionalized ILs are known as 'task-specific ionic liquids'. Applications range from catalysis and organic synthesis to tribology,

protective coatings and gate dielectrics. In most cases, the interface of the IL with its environment (gas, liquid, solid) plays an important role. Therefore, knowledge about interface properties and their relation to the chemical structure is of pivotal importance for choosing the right IL for a specific application. In contrast to most other liquids, ionic liquids have a very low vapour pressure, and thus can be studied with the methods of ultrahigh vacuum-based surface science. Thereby, detailed information on their surface composition, on segregation and enrichment effects, on the dissolution and reactivity of catalytically active metal complexes, on the growth of ultrathin IL-layers, and even on reactions in the liquid phase, can be obtained. Many of the derived conclusions are considered representative for liquid surfaces in general.