Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Probing the interface of Charged Surfactants in Ionic Liquids by XPS[1] LANG CHEN, HARRY BERMUDEZ, Department of Polymer Science and Engineering, University of Massachusetts Amherst — Room-temperature ionic liquids (ILs) are playing increasingly vital roles in many processes of both fundamental and applied natures such as separations and catalysis. It is therefore critical to obtain a better understanding of their interfacial properties such as surface charge and composition. Here we examine the influence of positively-charged surfactants on IL interfaces by X-ray photoelectron spectroscopy (XPS). The roles of surfactant alkyl chain length, concentration, and information depth on interfacial properties are investigated. Depending on the chain length and concentration, the surfactants can alter the IL interface to varying extents, highlighting a simple route to manipulate interfacial properties. XPS also reveals that surfactant counterions predominantly dissociate into the bulk. As a consequence, ion exchange occurs between surfactant and like-charged IL ion. Our results are a further demonstration of the ability of XPS to give insights into the surface activity and aggregation behavior in multicomponent ionic liquid systems.

[1]MRSEC and NSF

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Date submitted: 29 Nov 2012 Electronic form version 1.4