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Investigation of ionic liquid interfaces using time- and position-resolved XPS

X-ray photoelectron spectroscopy (XPS), a chemical analysis tool, is utilized for investigation of charge screening across metal electrodes fabricated on a porous polymer surface which is infused with an ionic liquid (IL). The IL provides a sheet of conducting layer to the insulating polymer film, and enables monitoring charging and screening dynamics at the polymer +IL/air interface in a laterally resolved fashion across the electrodes. Time-resolved measurements are also implemented by recording several peaks of the IL, while imposing 10-3 to 10+3 Hz square-wave-pulses (SQW) across the electrodes in source-drain geometry. Variations in the binding energy of the measured peaks (Au4f, C1s, N1s and F1s) reflects directly the local electrical potential, and allow us visualize screening of the built-in local voltage drop on and across the electrodes. Accordingly, the device is partitioned into two oppositely polarized regions, each following the polarization of one electrode through the IL medium. Impact of our findings with the presented structure and variants XPS measurements on understanding of various electrochemical concepts will be discussed.

Biography

Sefik Suzer has completed his PhD in 1976 from the University of California, Berkeley, USA. After his Post-doctoral studies from Sydney (Australia) and Freiburg (Germany) Universities, he joined at the Middle East Technical University in Turkey in 1979 and moved to Bilkent University in 1992. He has been serving as an Editorial Board Member of *Journal of Electron Spectroscopy*, *Applied Surface Science*, *Spectroscopy and Dynamics*, and as an Editor of *Surface Science Reports*, and is a Fellow of the American Vacuum Society since 2010.

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