UCMERCED UNIVERSITY OF CALIFORNIA School of Natural Sciences

CHEMISTRY SEMINAR 291

On the Mechanism of Selective Adsorption of Ions to Aqueous Interfaces: Graphene/Water vs. Air/Water

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Date: **11/17/17**
Time: **3:00 PM**
Location: **COB 267**

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ABSTRACT

The behavior of ions at aqueous interfaces has been a subject of much controversy for over a century. By exploiting the strong charge-transfer-to-solvent (CTTS) resonances of selected anions in aqueous electrolytes, their adsorption properties have measured by deep UV-SHG spectroscopy methods for both air/water and graphene/water interfaces. Temperature and concentration dependences determined by both experiment and computer simulations for the air/water case reveal that the strong interfacial adsorption observed for weakly hydrated ions is enthalpically driven by hydration forces and impeded by a novel entropy effect (capillary wave suppression). Extension of this approach to the water-graphene interface reveals a surprising similarity to the air-water case, albeit with very different mechanistic details. Our recent development of a broadband deep UV SFG spectroscopy technique has produced detailed CTTS spectra of interfacial ions, for which comparisons with bulk CTTS spectra provide additional new insights.

Reference: D. L. McCaffrey, S. C. Nguyen, S. J. Cox, P. L. Geissler, H. Weller, A. P. Alivisatos, and R. J. Saykally, "Mechanism of ion adsorption to aqueous interfaces: Graphene/water vs. air/water", PNAS, Early Edition, (2017).

BIO:

Rich Saykally holds The Class of 1932 Endowed Chair in the Department of Chemistry, and is a UC-Berkeley Distinguished Teacher. Over 70 students have completed the Ph.D. under his direction, and many postdocs and undergraduates have trained in his labs. He has received over 70 awards and honors, including international awards from 10 different countries, and is a member of the National Academy of Sciences and the American Academy of Arts and Sciences.