

Abstract Submitted  
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**Dimethyl Formamide Phase Evolution and Lithium Ethylene Dicarboxylate Solvation on Ag(111)**<sup>1</sup> JANICE REUTT-ROBEY, WENTAO SONG<sup>2</sup>, University of Maryland, College Park — The interactions of solvent molecules with electrode surfaces impact many interfacial chemical processes. In this talk, we examine the chemical and 2d structure evolution that follows adsorption of the polar solvent dimethylformamide (DMF) on Ag(111). We further reveal the impact of an organic ionic solute, lithium ethylene dicarbonate, on DMF phase evolution. Complementary STM, XPS and DFT methods characterize DMF dry etching of Ag(111) and concomitant Ag(DMF)<sub>2</sub> coordination complex formation. Monolayer phase evolution is tracked from a 2d gas mixture of DMF and Ag(DMF)<sub>2</sub> to ordered and nanophase-separated domains of DMF and Ag(DMF)<sub>2</sub>. A semi-quantitative surface pressure-composition phase diagram, derived from the data, illustrates how these monolayer phases are tuned by surface pressure. The ionic solute, lithium ethylene dicarbonate, shifts the phase equilibria of the solvent film, seeding the formation of ordered DMF domains at reduced surface pressures. Structural models are given for all ordered phases, and the 2d solvation of LEDC is described.

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