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## Electrowetting of Ionic Liquid on Graphite: Probing via in Situ Electrochemical X-ray Photoelectron Spectroscopy

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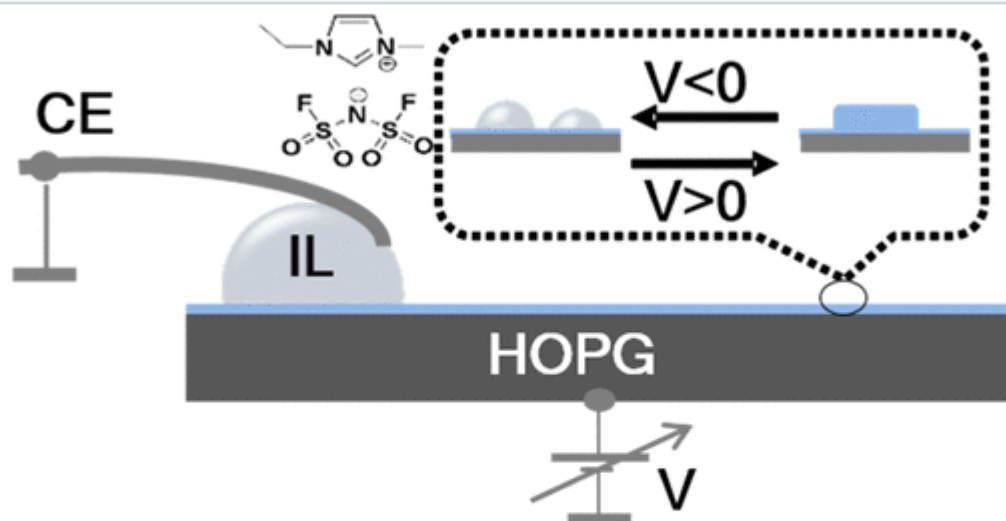
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### Abstract



Thin films of ionic liquid 1-ethyl-3-methylimidazolium bis(fluoromethylsulfonyl)imide ([EMIm][FSI]) vapor-deposited on highly oriented pyrographite (HOPG) were studied by X-ray photoelectron spectroscopy and atomic force microscopy. The results revealed a reversible morphological transition from a “drop-on-layer” structure to a “flat-layer” structure at positive, and not at negative, polarization. The effect is rationalized in terms of electric-field-induced reduction of the liquid–solid transition temperature in the ionic liquid film, when its thickness is comparable to the charge screening length. The observed bias asymmetry of [EMIm][FSI] electrowetting on HOPG is tentatively explained by the bilayer structure at the interface driven by the affinity of the imidazolium ring to the HOPG surface.