Self-assembling materials for *operando* metrology of energy storage materials

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The advancement of new instrumentation and hybrid methodologies is crucial to push the boundaries of *operando* structural and chemical characterization of energy storage materials, enhancing detection sensitivity, discrimination capabilities, and traceability. Within the OpMetBat (Operando Metrology for Energy Storage Materials - EPM project 21GRD01) project, our objective is to develop innovative instrumentation for traceable *operando* and hybrid (multimodal) analytical and dimensional characterization. Specifically, INRiM is in charge of the fabrication of optically-transparent windows for *operando* Surface Enhanced Raman Spectroscopy (SERS) analysis utilizing self-assembled block copolymers. Our effort promises to provide deeper insights into the formation and degradation of the Solid Electrolyte Interface (SEI) and Cathode Electrolyte Interface (CEI) formation and degradation with improved sensitivity and specificity.