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# Combining SANS with VSANS to extend q-range for morphology investigation of silicon-graphite anodes

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Silicon-based electrodes are attractive candidates as anodes for Li-ion batteries due to their high theoretical specific capacity. However, repeated lithiation/delithiation causes significant morphological changes of the silicon particles which results in formation of highly porous silicon structures and severe side reactions at the silicon/electrolyte interface. To quantify such morphological changes in the micrometer as well as on the nanometer scale, we combine very small-angle neutron scattering (VSANS) and small-angle neutron scattering (SANS) techniques. While conventional and contrast-matched SANS data provide insights into the solid-electrolyte-interphase (SEI) coverage around the silicon particles and filling of the evolving porosity within the electrode, VSANS data provide information on the micrometer-sized graphite particles.

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