

## Electrochemical Reduction Synthesis and Characterization of Silicon Nanoparticles

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The synthetic methods for Si nanoparticles include solution-based reduction, thermolysis and pyrolysis of silanes, physical methods. The electroreductive synthesis is a new method for synthesizing silicon containing functional materials including Si nanoparticles. Electrochemical reduction by its very nature does not require chemical reduction agents, and allows reaction control via electrode current and potential. In this study, we synthesized Si nanoparticles using an electroreductive synthesis with tetrachlorosilane and octyltrichlorosilan. Silicon electrodeposition from octyltrichlorosilane and/or tetrachlorosilane solutions in water-free tetrahydrofuran(THF) as solvents was demonstrated using Mg electrodes, lithium perchlorate as electrolyte. Each pair of Mg electrodes was connected to the current source, Keithley sourcemeter (model #2400) that supplied periodic current pulses. Using tetrachlorosilane and octyltricholossilane as Si precursors, the synthetic conditions and the characteristics of obtained Si nanoparticles will be presented.