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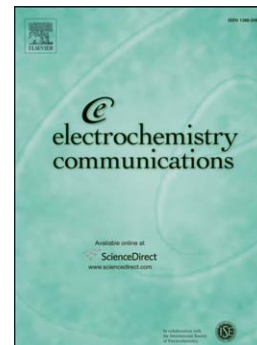
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# Amorphous Silicon Nanotubes via Galvanic Displacement Deposition

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## **Abstract**

Amorphous silicon nanotubes were grown in a single step into a polycarbonate membrane by a galvanic displacement reaction conducted in aqueous solution. In order to optimize the process, a specifically designed galvanic cell was used. SEM images, after polycarbonate dissolution, showed interconnected nanotube bundles with an average length of 18  $\mu\text{m}$  and wall thickness of 38 nm.

The deposited silicon was revealed by EDS analysis, whilst X-ray diffraction and Raman spectroscopy showed that nanotubes have an amorphous structure. Silicon nanotubes were also characterized by photo-electrochemical measurements that showed n-type conductivity and optical gap of  $\sim 1.6$  eV.

**Keywords:** Silicon nanotubes; Galvanic displacement deposition; Template synthesis; Li-ion batteries; Solar cells; Amorphous silicon.

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