

Virtual practicals & on-line tutorials

N°29

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Synthesis of silicon nanowires for anodes of high energy density lithium-ion batteries

Teachers:

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Silicon nanowires are a promising material for use in anodes of lithium-ion batteries: silicon offers a large energy density and the nanostructuring allows a stable cycling. During this session we will present you a novel way to synthesize silicon nanowires, using a derived CVD method. This allows us to produce silicon nanowires as a powder that can enter directly in an ink. You will analyze characterization data from these materials, which will include SEM images and EDX chemical compositions.

In a second session, you will see how to formulate the material in an ink for electrode making, and how to make a coin cell battery. We will give you some of our electrochemical results of cycling and we will discuss about the conclusions that we can make out of this.

At the end of this session you will have understood the growth mechanism of silicon nanowires in general and in our specific way. You will also have thought on relationships between form, size, chemical composition, and electrochemistry.