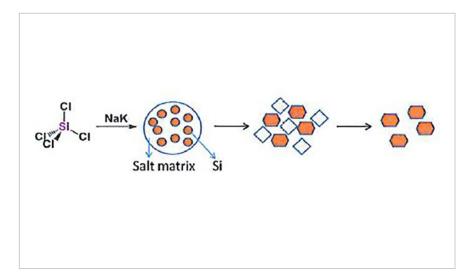
# Self-templating Synthesis of Silicon

## ID# 2013-4059





Synthesis of mesoporous silicon material

## **Technology Summary**

There are currently two methods to produce porous silicon materials including anodisation and stain etching. However, both of these methods need a solid silicon precursor or template, hydrofluoric acid, are high cost, and are not very efficient. The method disclosed here provides a mesoporous silicon material prepared by a template-free and hydrofluoric acid-free process. This process uses the reduction of a silicon-halogenide precursor with an alkaline alloy. The resulting silicon-salt matrix can then be annealed for pore formation and crystallite growth.

## Application & Market Utility

This method reduces the cost of traditional processes by eliminating the need for a template/precursor. It also eliminates the use of hydrofluoric acid, which is not environmentally friendly. Potential use in Li-ion battery anode material has shown good electrochemical performance. It has potential application in other research areas such as optical sensoring, drug delivery, and photocatalysis.

## **Next Steps**

Seeking licensing opportunities.

## **TECHNOLOGY READINESS LEVEL**

4-7

#### Seeking

Licensing |

#### Keywords

- porous silicon material
- silicon anode
- lithium-ion batteries

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