



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 sensing, 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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