<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Uniform Spatial Distributed Metal Sulfide Nanostructure/TiO2 Nanotube Hybrid for High Capacity Lithium-ion Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>Wei, Jiaqi</td>
</tr>
<tr>
<td><strong>Citation</strong></td>
<td>Wei, J. (2016, March). Uniform Spatial Distributed Metal Sulfide Nanostructure/TiO2 Nanotube Hybrid for High Capacity Lithium-ion Battery. Presented at Discover URECA @ NTU poster exhibition and competition, Nanyang Technological University, Singapore.</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>2016</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10220/41611">http://hdl.handle.net/10220/41611</a></td>
</tr>
<tr>
<td><strong>Rights</strong></td>
<td>© 2016 The Author(s).</td>
</tr>
</tbody>
</table>
Introduction

Nowadays, electronic devices like smartphone and laptop are dominating our daily life. The lithium ion battery, as the energy storage device becomes an important research topic, and a safe battery with high capacity is highly desired. However, the current status of battery rarely reaches the above requirements. This project aims to develop a battery with high capacity and extra stability by synthesizing the electrode material of metal sulfide nanostructure (MS_{X}) / TiO_{2} nanotube (TNT) hybrid.

Elongated TiO_{2} Nanotube Anode

- Hydrothermal reaction produces TNT
- Stirred hydrothermal reaction elongates the nanotube
- Crosslinking structure increases viscosity, stability and conductivity

Metal Sulfide-TiO_{2} Nanostructures

- Solvothermal synthesis of MS_{X}-TNT
- Real product and SEM images of the products

Battery Assembling and testing

- Assembling and testing procedure
- Electrochemical energy storage performance

MS_{X}-TNT showed higher capacity than pure TNT

Conclusion

The uniform heterostructures of metal sulfides nanoparticle/TiO_{2} nanotube have been synthesized successfully. The corresponding batteries electrode showed significantly improved capacity comparing to the pure TiO_{2} nanotube, while the stability remains. In consider of the availability of the materials, it is a suitable electrode material for high capacity lithium ion battery in practical application.

Reference