

## A new candidate of anode materials MAX phase (Nb<sub>2</sub>SnC)

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The material Nb<sub>2</sub>SnC combining advantages of MXene and Sn formed by heating the mix powder of Nb, Sn and carbon black<sup>1,2</sup>. Herein we report on the electrochemical intercalation of Li ions into Nb<sub>2</sub>SnC, it displays a higher capacity than as-produced other MXenes and graphite. When tested as anode for lithium ion batteries, the charge/discharge capacity of the Nb<sub>2</sub>SnC anode increases with cycling. For instance, after 600 charge/discharge cycles, the specific capacity increased from 80 mAh g<sup>-1</sup> to 150 mAh g<sup>-1</sup>, at a current density of 0.5 A g<sup>-1</sup>, and the capacity increased from 110 mAh g<sup>-1</sup> to 210 mAh g<sup>-1</sup> at 0.05 A g<sup>-1</sup>. It is demonstrated that when Li ions intercalate into Nb<sub>2</sub>SnC, the expansion of the Sn will open the layer by itself, the increasing capacity with cycling was considered evidence for the process<sup>3</sup>, as confirmed by scanning electron microscopy and transmission electron microscopy. Since Nb<sub>2</sub>SnC is just one of many MAX phase, this work lays the foundation for the development of the MAX phase as the anode of the lithium batteries.

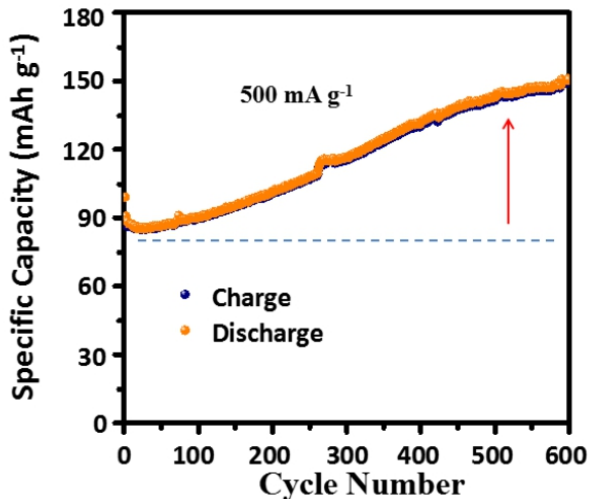
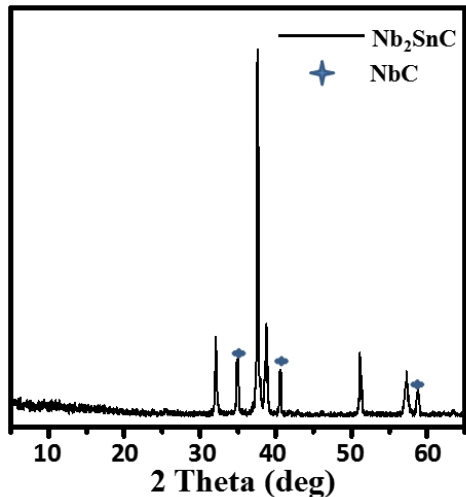


Figure1: XRD patterns of Nb<sub>2</sub>SnC

Figure2: Cycling performance of Nb<sub>2</sub>SnC at 500 mA g<sup>-1</sup>

### References:

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