Short Communication

Study on MnO₂/MXene-V₂C composite as cathode for magnesium ion battery

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doi: 10.20964/2020.11.25

Received: 29 June 2020 / Accepted: 15 August 2020 / Published: 30 September 2020

In this paper, the new 2D material MXene-V₂C was prepared by etching V₂AlC. Then, with MXene-V₂C as the base material and KMnO₄ as the manganese source, MnO₂/MXene-V₂C composites with different MnO₂ content are prepared by one-step hydro-thermal method. After a series of characterization analysis of the prepared samples, the results show that MnO₂/MXene-V₂C has the best performance when MnO₂ content is 20%. As shown from the results, when the charging and discharging current is 100mA/g, the first discharge capacity of the composite is up to 130mAh/g, which is 2.4 times as much as that of MnO₂ as the cathode material alone, and it decays to 41% after 100 cycles, which is close to the first discharge specific capacity of MnO₂. The adding of the MXene-V₂C increases the conductivity and stability of MnO₂.

Keywords: MnO₂/MXene-V₂C, composites, magnesium ion batteries, cathode

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