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Effect of growth time of hydrothermally grown VO₂ for supercapacitors applications

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In this work, we report the time-dependent synthesis of VO₂ microspheres and nanosheets by hydrothermal method with a systematic improvement in physical and electrochemical properties such as specific surface area and specific capacitance at synthesis time of 6 h. VO₂ microspheres and nanosheets were characterized by SEM, BET and XRD. The results show that variation of reaction time plays a crucial role in the transformation of samples morphology. VO₂ microspheres synthesized within 4 h represents the intermediate reaction time between VO₂ microsphere and nanosheets. VO₂ grown at 6 h under the same synthesis conditions exhibited the highest specific capacitance of 485 F g⁻¹ at a current density of 0.5 A g⁻¹ in 6 M KOH electrolyte using Ni foam as a current collector and also showed excellent stability with ~ 98.5 % capacitance retention after 1000 cycles at a current density of 10 A g⁻¹. Based on the above results, the VO₂ nanosheets show a considerable potential as electrode materials for supercapacitor applications.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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