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## Effect of growth time of hydrothermally grown VO<sub>2</sub> for supercapacitors applications

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In this work, we report the time-dependent synthesis of VO<sub>2</sub> 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. VO<sub>2</sub> 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. VO<sub>2</sub> microspheres synthesized within 4 h represents the intermediate reaction time between VO<sub>2</sub> microsphere and nanosheets. VO<sub>2</sub> grown at 6 h under the same synthesis conditions exhibited the highest specific capacitance of 485 F g<sup>-1</sup> at a current density of 0.5 A g<sup>-1</sup> 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<sup>-1</sup>. Based on the above results, the VO<sub>2</sub> 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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