

# Synthesis of manganese oxide thin films by hydrothermal route and its structural and electronic properties for energy storage applications

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## Abstract:

The manganese oxide thin films are synthesized by hydrothermal method with the different composition of the metallic precursor. The porous surface microstructure with hydrophilic surface nature potentially promotes the intercalation of the Mn ions from the MnO<sub>2</sub> to the Na<sub>2</sub>SO<sub>4</sub> electrolyte to enhance the electrochemical performance. The structural stability of the films at higher concentration reduced by synergistic effect of the in-plane bond stretching motion of the pairs of Mn – O bond and it also diminish the electrochemical performance at the higher composition. The electrochemical measurements shows that the intermediate composition exhibit the higher value of the specific capacitance due to the enhancing ionic diffusion due to the lowering the internal resistance which promote the intercalation of the through the porous electrode and electrolyte interface.

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