

# **Surfactant-Assisted Synthesis of Smooth-Surfaced Polyaniline Nanoparticles: Enhancing Electrochemical Performance for Supercapacitors**

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## **Abstract**

One of the important factors that control the electrochemical behaviour of polyaniline is known to be its morphology. Morphological alterations are known to significantly impact the polymer properties and can be controlled during the polymerization process. This study reports the synthesis of a surfactant-assisted polyaniline through a simple and inexpensive in situ chemical polymerization method. The physical characterization results such as electron micrographs, confirmed the topographical changes during synthesis, resulting in smooth surfaced electrode material. The presence of surfactant during polymerization had a synergistic effect on the electrochemical properties of the polyaniline as compared to bare polyaniline. Addition of the surfactant during synthesis improved the electronegativity of the as synthesised polyaniline, thus enhancing its performance such as specific capacitance and cyclic stability.

## **Keywords**

Polyaniline electrode, Surfactant, Electrochemical study, Supercapacitor electrode, Specific capacitance, Cyclic stability.