



# Characterization Techniques for Nanomaterials in Energy Storage within African Contexts: A Focus on Madagascar

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## Abstract

Nanomaterials are pivotal in energy storage applications due to their unique properties such as high surface area and tunable structures. Literature reviews were conducted to identify and analyse characterization methods relevant to nanomaterials in energy storage applications. A notable finding is the widespread use of transmission electron microscopy (TEM) for material analysis, contributing to a better understanding of nanomaterial structures. Characterization techniques play a crucial role in optimising nanomaterials for energy storage applications, especially in African contexts like Madagascar. Investment in advanced characterization tools and training programmes for local researchers is recommended to enhance the development of sustainable energy solutions. Nanomaterials, Energy Storage, Characterization Techniques, Transmission Electron Microscopy (TEM), Madagascar The empirical specification follows  $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** African, Geometric Phase Analysis, Nanosynthesis, Scanning Tunneling Microscopy, X-Ray Diffraction, Energy Harvesting, Porous Materials

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