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## Synthesis of $\text{Na}_2\text{Ti}_3\text{O}_7$ Nano-Rods Using Vein Graphite Flakes via The Low-Cost Hydro Thermal Technique

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$\text{Na}_2\text{Ti}_3\text{O}_7$  has been prepared by using different synthesis methods and studied for various applications in sensors, filtration, drug delivery platforms, catalysis, tissue engineering, etc. Recently,  $\text{Na}_2\text{Ti}_3\text{O}_7$  has received a greater attention as a promising negative electrode material for Na-ion batteries. It is reported here the synthesis of  $\text{Na}_2\text{Ti}_3\text{O}_7$  nano-rods, via hydrothermal technique on graphite flakes, for the first time. The synthesized material was characterized by scanning electron microscopy and the result showed that formation of well separated nano-rods with around 10-100 nm in diameter on graphite flakes. Further, the prepared material was characterized by using X-ray diffractometer (XRD), BET surface area analyzer and particle size analyzer. The XRD pattern of the  $\text{Na}_2\text{Ti}_3\text{O}_7$  nano-rods synthesized in this study is well matched with the standard XRD pattern of  $\text{Na}_2\text{Ti}_3\text{O}_7$  crystalline material. The graphite flakes seemed to have supported for the formation of nano-rods on the surface of the graphite and this is supposed to be a catalytic effect to the formation. Altogether, the method introduced in the present study can be proposed to synthesis titanium based nano-structured materials needed for different technological applications. The applicability of this novel  $\text{Na}_2\text{Ti}_3\text{O}_7$  nano-rods as an anode material for Na-ion batteries is expected to be investigated further.

**Keywords:**  $\text{Na}_2\text{Ti}_3\text{O}_7$  nano rods, hydro thermal technique, anode material, Na-ion battery