Área: MAT

Synthesis of sodium trititanate nanotubes by the hydrothermal method

Assis de O. Alves* (IC)[1]; Flávio M. Vichi (PQ)[1]

fmvichi@iq.usp.br; assis.alves@usp.br;

[1]*Department of Fundamental Chemistry, Institute of Chemistry, University of Sao Paulo (USP), São Paulo–SP, Brazil;*

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Highlights

We report the synthesis of $Na_2Ti_3O_7$ using the hydrothermal method, varying temperature, time and autoclave filling. Evaluate the nanostructures formed in post-thermal treatment. Characterization of the structure by XRD and the surface area and porosity by the BET isotherm.

Resumo/Abstract

Nanostructured titanates (TNS), obtained by alkaline hydrothermal treatment of TiO_2, are semiconductors widely studied for their properties such as surface area, porosity and ion exchange capacity. However, their morphology is heavily influenced by synthetic and post-reaction treatment conditions. In this study, synthesis parameters were varied in order to determine the morphology of the nanostructures. The materials were characterized by X-ray diffractometry (XRD), thermal analysis (TG, DTG and DSC), surface area analysis using the BET method by N_2 adsorption at 77 K, and transmission electron microscopy (TEM).

The nanotubes (Fig 1A) were obtained at 140ºC/ 24 h presented the diffraction pattern shown in Fig. 1B, and a surface area of 23 m^2g^{-1}. This value decreases as the calcination temperature increases, indicating an increase in crystallinity.

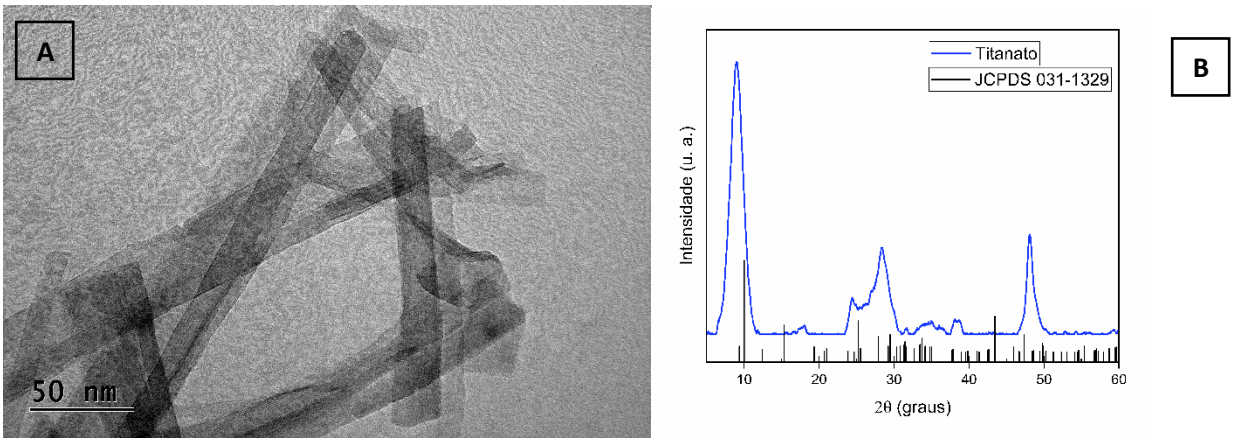

Figure 1: (A) TEM of nanotubes showing an average diameter of 7nm (B) XRD pattern of the particles showing a trititanate, $Na_aTi_3O_7$, crystal structure.

References

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