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PROCEEDINGS

INFLUENCE OF THE SOLID-STATE REACTION METHOD ON COPPER VANADATE SAMPLES

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Copper Vanadate is a material used in various fields [1]. To synthesize this material in a single phase, two samples of CuO were mixed with V₂O₅ by solid-state reaction. The annealing time was varied for each sample: 12 hours for the first (A1) and 15 hours for the second (A2), both at 700°C. The XRD results show that sample A1 formed Cu₂V₂O₇ (52.1%), Cu_{2.32}V₄O₁₁ (27.1%) and Cu₃V₂O₈ (20.8%). Sample A2 formed Cu₂V₂O₇ (41.6%), Cu₃V₂O₈ (30.5%) and Cu_{2.32}V₄O₁₁ (27.9%). The estimated crystallite were 104 nm (A1) and 103 nm (A2). The difficulty in obtaining pure samples of copper vanadate can be related to several factors, including the initial composition of the precursors [2] and the solid-state reaction method, which can affect the stoichiometry because it requires heat treatment at high temperatures, which can result in multiple phases [2]. The difficulty in obtaining pure samples of copper vanadate, regardless of the synthesis method used, is widely acknowledged in the literature [3]. It should be emphasized that this study aims to contribute to understanding the processes of synthesis and formation of copper vanadate phases.

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References:

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[2] CARMO, J. R. do. IPEN-CNEN/SP. 100 (2011).

[3] OLIVEIRA, Jessica A. et al. Materials Research Bulletin 149., 10 (2022).