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Use alloy quasicrystalline $\text{Al}_{62,2}\text{Cu}_{25,3}\text{Fe}_{12,5}$ for steam reforming of methanol

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This study shows the good performance of quasicrystal $\text{Al}_{62,2}\text{Cu}_{25,3}\text{Fe}_{12,5}$ as catalyst in catalytic reactions. This metallic catalyst without being leached with acid or base, with dry stoichiometric composition $\text{Al}_{62,2}\text{Cu}_{25,3}\text{Fe}_{12,5}$ revealed among the reactions occurring be a partial oxidation; formation of products which were methanol, methanol + methanoic acid, water and dimethyl ether. For this research used experimental techniques as X-ray Diffraction-XRD to follow the evolution of the alloy phase, the Scanning Electron Microscopy-SEM that allows the study of surface microstructure, (SBET) verify surface area of the catalyst quasicrystal and Transmission Electron Microscopy-TEM, studying the morphology of internal phases, quasicrystalline nuclei and defects; testing for the catalytic conversion of methanol and selectivity and products formed from this material used as catalyst. It should say, the processes of formation of the alloy depends quasicrystalline of chemical elements that compose it and the production techniques of the alloys, this may get different morphologies and different quasicrystal desired phases, can increase / decrease the icosahedral. The phase activity and stability of quasicrystal catalyst for steam reforming of methanol showed sufficient performance compared to other catalysts. The Fe and Cu species highly dispersed in the homogeneous layer quasicrystal catalyst increases the catalytic activity and suppresses the aggregation of Cu particles. We propose that the quasicrystal can be a good catalyst to be used in catalytic steam reforming, with high catalytic activity and excellent thermal stability.

Biography

Lourdes Cristina Lucena Agostinho Jamshidi, Bachelors degree in physics from the Federal University of Campina Grande (2005), Bachelor Degree in Industrial Chemistry (2002), Graduate Full Degree in Chemistry from the State University of Paraíba (2009), Specialization in Teaching Mathematics (IMPA / UFPB). Has experience in the area of chemistry and physics, with emphasis on Experimental Techniques in Photoacoustic Spectroscopy in Materials Science with Study in Theory of Crystalline Solids, as studies in Minerals & Systems Polymer Chains applied in Experimental Condensed Matter Physics, Inorganic and Physical Chemistry. She is currently in the Master of Science in Materials area Universidade Federal da Paraíba (2009) with emphasis on Ciências Materials and Ph.D. in Chemical Engineering from the Federal University of Pernambuco (UFPE) in Heterogeneous Catalysis.

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