

## **Synthesis of the AIPO-5 Aluminophosphates in Presence of Vanadium and Investigation of the Vanadium Positions in the Structure**

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**Abstract:** AIPO-5 molecular sieves were synthesized hydrothermally in presence of 2-20% of vanadium in the primary gel composition. Triethylamine was used as a structure directing agent. Aluminum oxy hydroxide and phosphoric acid were used as sources of aluminum and phosphorous of the gel, respectively. Crystallization was performed by heating the samples at 190°C for 18-72 hours to obtain highly crystalline materials. The samples containing 2-16% vanadium preserve their structure upon calcination at 550°C but structure of the sample containing 20% of it collapses at this temperature and tridymite is the produced phase. Methods of X-ray diffraction, energy dispersive X-ray spectrometry associated with scanning electron microscope and diffuse reflectance spectroscopy were used for structural and chemical characterization of the materials.

The evidences acquired from above methods show that some of the V(V) in the as-synthesized materials have been reduced to V(IV) during synthesis procedures. The DR spectra of the as-synthesized samples show three distinct 280, 580 and 750nm bands which the first one was attributed to the tetrahedral V(V) and the two later ones to tetrahedral V(IV). The samples containing higher amounts of vanadium (10% , 16%) show a 350 nm band on the shoulder of 280nm which was assigned to V(V) surface-grafted species.