

E0003

γ -Titanium Phosphate Surfactants Intercalation Compounds: Structural and Thermal Characterization. C. Ferragina^a, R. Di Rocco^a, and P. Giannoccaro^b, ^aCNR, Monterotondo (Roma), ^bDip. Chimica, Univ. di Bari, Italy.

A new family of organo-inorganic layered solids in which surfactant species act as structuring agents has been synthesized. The obtained materials can be used in the heterogeneous catalysis. We studied the X-ray characterization and the thermal behavior of alkyltrimethylammonium ions (C_n^+TMA ; $n=12,14,16,18$) intercalated into layered γ -titanium phosphate [γ -Ti(PO_4)(H_2PO) $_4$ · $2H_2O$ (γ -TiP)] an inorganic ion-exchanger. The content of the surfactants depends on the length of their chain.

The thermal analyses show a stability of the materials up to 220°C. With the intercalation of C_n^+TMA , the interlayer distance d is remarkably increased of $\sim 20\text{\AA}$, with respect the host precursor γ -TiP. According to the surfactant chain length, the longer the chain the d increases. All the diffractograms show an intense first reflection indicating an ordered structure and, apart from the first harmonic, few weak reflections appear at large angles. The high d value suggests that the C_nTMA^+ chain is arranged within the host layers in a lengthwise configuration a bit tilted. The $C_{12}TMA^+$ derivatives are less crystalline and maintain a γ -TiP phase. The layered structure is maintained up to 300°C. The cubic titanium pyrophosphate is present at 1100°C.