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Aluminophosphates (AlPO) constitute an important family of microporous materials. They are composed of Al and P atoms arranged in a neutral structure. These materials are known for their applications in various fields.
Among, these materials KAlPO4F, the as -prepared product obtained by hydrothermal route at 180 ℃. The white solid was characterized by different methods such as powder X-ray diffraction, thermal analysis, SEM image and UV–Vis diffuse reflectance spectroscopy.
The as- prepared compound crystallizes in an orthorhombic system (Space Group: Pnna) with the refined lattice constants: a=12.612(5) Å, b=10.172(3) Å, c=6.205(0) Å. The structure is made up of AlF2O4 octahedra and PO4 tetrahedra where the K+ ions are disordered.
Thermal analysis shows that our phosphate is thermally stable up to 300 ℃. SEM images shows crystals with hexagonal sections. The direct optical transition of 4.93 eV, determined from the diffuse reflectance, is assigned to the charge transfer F−: 2p⟶ K+: 4s.
The photocatalytic performance was successfully tested through the degradation under solar light of methyl violet (MV), a hazardous and persistent dye. A total discoloration was obtained after 5 h illumination and a reaction mechanism is proposed.

Keywords: aluminophosphate, photocatalysis,environment, wastewater, light, chemistry

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