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(Southern Tunisia)

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**Phosphoric acid purification through different raw and activated clay materials
(Southern Tunisia).**

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Abstract

This study concerns the purification of Tunisian phosphoric acid produced by the Tunisian Chemical Group (TCG), using raw and activated clays materials from Southern Tunisia. These Gafsa basin clays samples (Jebel Hamadi (JHM); Jebel Stah (JS) and the El Hamma area (Jebel Aïdoudi (JAD)) were activated with 3M, HCl solution. Phosphoric acid purification was performed on raw and activated clays. Mineralogical characterisation was carried out using the X-ray powder diffraction method and infrared absorption spectroscopy. Textural changes between raw and activated clays were identified using SEM observations and specific surface analysis. Jebel Hamadi clays were almost dominated by smectite associated with kaolinite and illite traces, while Jebel Stah and Jebel Aïdoudi clays were composed of the association of smectite, illite and kaolinite. It is worth noting that the position of the smectite (001) reflection increased after the acidic activation in all studied samples, indicating the relaxation of the smectite structure along the c-axis. This was corroborated by the increasing specific surface area of the clay particles with the activation process. The specific surface area was close to $50\text{m}^2/\text{g}$ and $200\text{m}^2/\text{g}$, for raw and activated materials, respectively. The maximum phosphoric acid purification was obtained by using activated clays with 3N HCl for 4h. This performance correlated with the maximum of the

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