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MECHANICAL ACTIVATION OF RARE EARTH ELEMENTS BY PLANETARY BALL MILL FROM PHOSPHATE MINERALS AND ITS SURFACE PROPERTIES

A K Darban¹, H S Naghadeh², M Abdollahi³, P Pourghahramani⁴ and R D Webster¹

¹Nanyang Technological University, Singapore

²Tarbiat Modares University, Iran

⁴Sahand University, Tabriz, Iran

The mechanical chemical activation method has shown promise tool for pretreatment in the recovering of rare earth metal from wastes because it triggers physicochemical changes from particle comminution, new surface generation, crystalline structure defects and polymorphic transformations. In this paper, a new pretreatment method was employed for the enhancement of phosphate mineral comminution by planetary ball mill in the atmosphere environment for mechanical activation. The mechanical activation was carried out by milling of phosphate concentrate for 20, 60 and 90 min. The analysis of X ray diffraction (XRD) patterns of mechanically activated phosphate concentrate indicated that no phase transformation occurred during milling operation. In addition, the microstructural changes to nano size particles of mechanically activated phosphate concentrate were completely obvious from broadening of XRD peaks. The XRD peaks indicated that most minerals changed to amorphous which basically modified their properties for further enrichment.

akdarban@modares.ac.ir
akhodadadi298@gmail.com