

Process Mineralogy Characteristics and Mineral Processing Technology of Sillimanite Ore from Nanyang Area, China

TIAN Jing-jing, GUAN Jun-fang, GAO Hui-min, JIN Jun-xun

(School of Resource & Environmental Engineering, Wuhan University of Technology, Wuhan 430070, China)

Abstract: This paper presents a detailed study on process mineralogy of sillimanite ore from Anyang Area, China by using optical microscopy, X-ray diffraction analysis and chemical analysis. Results reveal material composition, main embedded mineral features and existing occurrence of major detrimental elements. Results show high weathering degree of the ore and being difficult to remove detrimental Fe_2O_3 and TiO_2 . Based on the characteristics of the process mineralogy of sillimanite ore, a closed circuit test of one stage of roughing, one stage of cleaning and three stages of scavenging were adopted to treat the sillimanite ore. The grade of sillimanite concentrate was 89.11%, representing a gain of 51.41% of sillimanite recovery and 51.62% of Al_2O_3 recovery. The physicochemical properties of sillimanite concentrate reach the grade of GP—54 based on YB/T 4032 – 2010 national industry standard.

Keywords: Sillimanite; process mineralogy characteristics; occurrence; mineral processing