

Effect of Cooling Approaches on Chemical Compositions, Phases, and Acidolysis of Panzhihua Titania Slag

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Abstract : Titania slag is a high quality raw material containing titanium in the subsequent process of titanium pigment. The effects of cooling approaches of granulating, water cooling, and air cooling on chemical, phases, and acidolysis of Panzhihua titania slag were investigated. Compared to the original slag which was prepared by the conventional processing route, the results show that the titania slag undergoes oxidation of Ti^{3+} during different cooling ways. The Ti_2O_3 content is 17.50% in the original slag, but it is 16.55% and 16.84% in water cooled and air-cooled slag, respectively. Especially, the Ti_2O_3 content in granulated slag is decreased about 27.6%. The content of Fe_2O_3 in granulated slag is approximately 2.86% also obviously higher than water ($\leq 0.5\%$) or air-cooled slag ($\leq 0.5\%$). Rutile in cooled titania slag was formed because of the oxidation of Ti^{3+} . The rutile phase without a noticeable change in water cooled and air-cooled slag after the titania slag was cooled, but increased significantly in the granulated slag. The rate of sulfuric acid acidolysis of cooled slag is less than the original slag. The rate of acidolysis is 90.61% and 92.46% to the water-cooled slag and air-cooled slag, respectively. However, the rate of acidolysis of the granulated slag is less than that of industry slag about 20%, only 74.72%.

Keywords : cooling approaches, titania slag, granulating, sulfuric acid acidolysis

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