

Experimental analysis of titanium dioxide synthesis from synthetic rutile waste using a moderate acid concentration and temperature

ABSTRACT

The present study is to clarify the present influences of acid concentration and temperature of caustic hydrothermal method on extracting the titanium dioxide (TiO₂) from synthetic rutile waste. In this experimental work, the caustic hydrothermal method comprises two processes: a decomposition and the sulphate process. The extracted titanium is characterized by using a electron dispersive X-ray spectroscopy to specify its chemical composition, field emission scanning electron microscope to determine the morphology and particle size, and lastly it is the X-ray diffraction to analyse the crystallinity of extracted titanium. In this study, we found that both acid concentration and temperature affected the TiO₂ growth while the calcination process could improve the crystallinity of extracted titanium.