

KINETICS OF SYNTHESIS OF POTASSIUM TITANATE FROM ILMENITE CONCENTRATE OF THE IRSHANSK DEPOSIT

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Zhytomyr region is one of the few regions of Ukraine with significant titanium ore reserves [1]. Titanium ore processing produces a variety of active titanium-containing compounds that are widely used in many industries. Among such substances, potassium titanate takes a worthy place, which is the basis for the manufacture of cosmetics and pharmaceuticals, has effective photocatalytic properties, in particular, accelerates the photodestruction of methylene blue in solutions, etc. [2, 3].

The aim of the study is to investigate the kinetics of the alkaline leaching process of ilmenite concentrate from Irshansky GOK in Zhytomyr region containing ilmenite (70 %) with potassium carbonate.

Fig. 1 shows a photograph of ilmenite concentrate (appearance).



Figure 1. Appearance of ilmenite concentrate

To construct the kinetic dependence, the ilmenite concentrate was fused with potassium carbonate at 200 °C for 30, 90, 100, 110, and 120 min. The quantitative content of potassium titanate in the melt was determined photometrically at a wavelength of 440 nm.

Fig. 2 shows the dependence of the optical density of the formed potassium titanate on the heating time of the components.

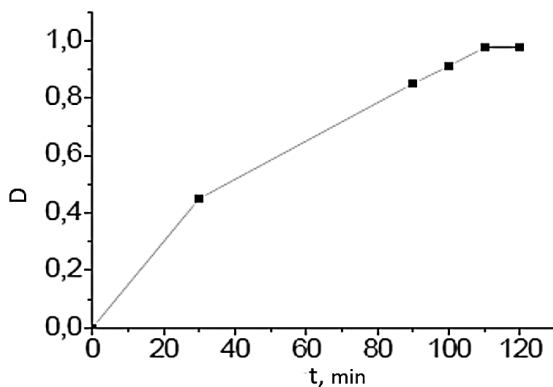


Figure. 2. Dependence of the optical density of the formed potassium titanate on the heating time of the components

As can be seen from the experimental data, the optimal time for the alkaline leaching of ilmenite concentrate with an ilmenite content of 70% with potassium carbonate at 200 °C is 110-120 minutes, and further heating time does not significantly affect the yield of the final product.

The process of alkaline leaching of ilmenite with potassium carbonate is a promising alternative method for producing reactive titanium-containing compounds.

References:

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