

The effect of the chemical nature of initial alkoxides taken for hydrolysis and calcination conditions of obtained precipitates on morphology and a specific surface area of titanium dioxide powders

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Abstract

The effect of chemical nature of initial alkoxides taken for hydrolysis and calcination temperature of obtained precipitates on morphological characteristics of the final products – titanium dioxide (TD) powders are discussed in the paper.

It has been shown that nature of initial titanium alkoxide influenced on the particles size of the obtained TD powders. The amount of fine particles (less than 0.5 microns) in TD powders is increased from 40.32 to 97.85% in order: titanium tetratertbutoxide → titanium tetraisopropoxide → titanium tetrapropoxide → titanium tetrabutoxide.

Increasing the calcination temperature of oxohydroxide precipitates leads to the growth of average particle size and decreasing of specific surface area (S) of the obtained TD powders. Simultaneously, the increase in percentage of narrow pores and decrease in percentage of wide pores in the particles of the material are observed. However, even in TD powders heated above 600 °C approximately 40% of the particles are smaller than 0.5 microns. The value of S for samples calcined at 600 and 900 °C remained 50-55 and 8 m²/g respectively.