

# SPECTROSCOPIC STUDY OF STRUCTURAL MODIFICATIONS IN CRYSTALLINE SILICA

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## S u m m a r y

Spectroscopical investigations of the radiation-induced structural phase transition in crystalline silica (alpha-quartz) irradiated by various doses of fast neutrons have been carried out. The optical methods of reflectance IR and Raman spectroscopy and the X-ray diffraction method have been used. The regularities for the radiation-induced modifications in the spectral characteristics of some of the bands due to the crystal reconstruction have been revealed, as well as the parameter variations for the bridge bond vibrations of the valence and deformation types. It is suggested that two processes take place during the irradiation: the decay of a part of the Si—O—Si bonds and their deformation, both resulting in a modification of the initial structure. The comparison with the X-ray spectroscopy data on certain parameters and with the Raman spectra obtained at silica heating has been done. The correlation between relevant dependences has been found. The conclusion has been made about the appearance, at the definite stage of the irradiation by fast neutrons, of the state similar to the high-temperature structural modification of quartz.