On the kinetics of phase transition at static pressure

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X-ray diffraction measurements were performed on the sample of commercially pure titanium under static loading and room temperature. A single crystal X-ray diffractometer with the Imaging Plate two-dimensional detector was used for measurements. Static loading was created using the membrane-type high-pressure cell with anvils having 0.5 mm in diameter. Sodium chloride (NaCl) served as the pressure propagation medium and the diffraction standard. The gasket was made of inconel metal. Pressure attained in experiments was 8.3 GPa. Data on changes in structural characteristics of the titanium-phase under pressure were obtained, i.e. parameters of the crystalline lattice and the elementary cell volume. Initial stage kinetics for the transition was recorded in the course of 66-hour exposure to 8 GPa constant pressure. After this exposure, the sample was found to be in the two-phase state. Under cell release, the reverse transition was not observed to take place. The Rietveld method helped to update experimental data in the FullProf code. Parameters of the alpha-, and omega-phases were determined at 8 GPa and in the final two-phase state at standard pressure.