

Prize CRYTUR 2024 - Abstract:

Structure parameters of martensite in Ti alloys modified by presence of oxygen atoms

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This study discusses the influence of beta-stabilizing elements and oxygen on the martensitic structure in metastable β titanium alloys. The introduction describes the crystallographic nature of the metastable martensitic phase and its relation to the bcc and hcp phases. Additionally, the study presents the results of a measurement of transmission X-ray diffraction, by which we determined two components involved in the formation of the martensitic phase - shear and shuffle. The analysis of the first component, shear, was carried out quantitatively using lattice parameters. The second component, shuffle, was analyzed by determining the crystal structure of the martensitic phase and all atomic positions. Finally, the study also demonstrates a HRTEM measurement with subsequent image processing to confirm or disprove the presence of O' phase nanodomains.