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STRUCTURE AND GROWTH OF OMEGA-Ti NANOPARTICLES IN BETA-Ti SINGLE CRYSTALS STUDIED BY ANOMALOUS X-RAY DIFFRACTION

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Nanoparticles of hexagonal ω phase in bcc-Ti(Mo) single crystals (β phase) occur due to a diffusionless athermal β to ω transformation and they grow during follow-up ageing at elevated temperatures, while the alloying atoms (Mo in our case) are expelled from the nanoparticle volumes. We used anomalous x-ray diffraction for the study of local chemical composition of growing ω particles and we found that a Mo-rich shell at the particle/matrix interface is created during the particle growth. Moreover, the expelled Mo atoms create a cloud with higher Mo density around each particle and its Mo concentration profile was studied by anomalous x-ray diffraction and small-angle scattering.

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