



Contribution ID: 27

Type: **Poster**

Texture of Hot-Compressed Metastable β -Titanium Alloy Ti5321 Studied by Neutron Diffraction

Friday 6 December 2024 13:45 (3 hours)

The textures of the β - and α -phases of the metastable β -titanium alloy Ti5321 after hot deformation were investigated by neutron diffraction. A hot-rolled bar was solutionized in the β -phase field and then hot compressed above and below the β -transus temperature. The initial texture after full recrystallization and grain growth in the β -phase field exhibits a weak cube component $\{001\}\langle 100 \rangle$ and minor $\{112\}\langle 110 \rangle$ and $\{111\}\langle 110 \rangle$ components. After hot compression, a $\langle 100 \rangle$ fiber texture is observed, increasing in intensity with compression temperature. Below the β -transus temperature, dynamic recrystallization of the β -phase and dynamic spheroidization of the α -phase interact strongly. The texture of the α -phase is a $\langle 11\bar{2}0 \rangle$ fiber texture, increasing in intensity with decreasing compression temperature. The mechanisms of texture formation during hot compression are discussed.

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Session Classification: Poster Session

Track Classification: Material Science