

# Nanoobjects microscopy

## Field ion microscopy of triple junction configuration in high-textured tungsten

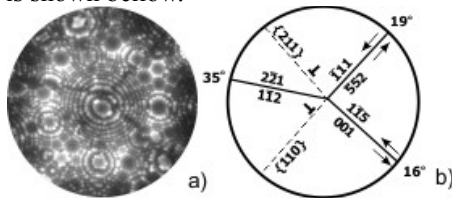
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Grain boundary structure in hard-drawn tungsten was investigated using the field ion technique. It was revealed that the grain distribution is mostly characterized by the special non-CSL grain boundaries. These grain boundaries belong to asymmetrical and incommensurable type [1]. The structure of special non-CSL grain boundaries can be described in terms of Frenkel-Kontorova model. Due to incommensurability of these GBs non-barrier interface sliding might occur.

Triple junctions with unusual spatial configurations were registered during special non-CSL grain boundaries study. The image (a) and corresponding scheme (b) of triple junction of special non-CSL boundaries with  $35^\circ$ ,  $19^\circ$ ,  $16^\circ$  misorientation angles is shown below.



Distinctive feature of this triple junction is spatial coincidence parallelism of two boundary planes with sliding planes in two opposite grains. This configuration of triple junction indicates to geometrical ability of self-coordinated intergrain and intragrain sliding [2]. The material continuity in the result of such accommodation sliding is saved without substantial accumulation of discrepancy in vicinity of triple junction.

1. *E.V. Sadanov, T.I. Mazilova et al.* Special non-CSL grain boundaries in tungsten: Misorientation distribution and energetics // *Mat Let.*-2015.- **145**.-P. 137-140.
2. *E. V. Sadanov, I. V. Starchenko I. M. Mikhailovskij.* Field ion microscopy of grain boundaries in high-textured tungsten // *Microscopy and imaging science: practical approaches to applied research and education* -2017.-**Formatex** - P. 423-430.