Nanoobjects microscopy

Special boundaries between crystals of ferrite and martensite during decomposition of austenite steel doevtektoidnoy.

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The structure of steel 30HS2 after isothermal decomposition of supercooled austenite decomposition products fixation by water quenching was investigated. Analyzing the structures obtained by the decay in the temperature range 200 ... 700 °C, TTT diagram was built by metallographic method. Methods of electron diffraction microscopy the austenite transformation products in steel 30HS2 determined that decay at 400 ... 500 °C in the structure of a mixture of crystals of excess ferrite, bainite, martensite and retained austenite. Indexing microdiffraction patterns together with the analysis of dark-field images showed that within one of the former austenite grain between adjacent ferrite and martensite crystals are special boundaries, often type $\Sigma = 3$ [1]. In this case, relative rotation of the two zones around the common axis $[011]_{\alpha} \parallel [011]_{M}$ may be 70,5°, which corresponds $\Sigma = 3$ or 50,5°, which corresponds $\Sigma = 11$.

Such crystallographic dependence observed between the gratings in low carbon martensite laths due to the implementation of OS Kurdumov - Sachs between the daughter crystals in one package martensite transformation of austenite during shear [2].

Thus microdiffraction studies have shown that

1.Between the crystals of martensite and proeutectoid ferrite can be realized in the concept of special border RSU $\Sigma = 3$, $\Sigma = 11$ at temperatures bordering the bainitic transformation.

2.When $\gamma \rightarrow \alpha$ transformation between ferrite and austenite can be realized Kurdjumov-Sachs orientation relationship.

1.Сухомлин Г.Д. Большеугловые низкоэнергетические границы в мартенситных структурах доэвтектоидных сталей.// Металлофизика и новейшие технологии. – 2013 т.35, – № 8 С.1109-1122

2.Kurdumov G.V., Sachs G., *Zeit. Phys.* **64,** №9**:**325 (1930).