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● 日本銅学会誌「銅と銅合金」第 63 巻 1 号(2024) p. 1-7
「固溶型銅合金における高温変形中の転位増殖と転位運動に対する合金元素の作用」
柄澤 誠一 他

・ページ1 英文タイトル

誤	Effect of Alloying Element on Dislocation Multiplication and Dislocation Motion during High–Temperature Deformation in Solid–Solution Copper Alloys
正	Effects of Alloying Elements on the Multiplication and Motion of Dislocations during High-Temperature Deformation in Solid-Solution Copper Alloys

・ページ1 英文概要

誤	Pure coppers and Cu−30 mass％ Zn（Cu−Zn）alloys were tensile−deformed at room temperature and 573 K. Dislocation multiplications and dislocation motions during the tensile deformations were evaluated by neutron diffraction line−profile analysis. The dislocation density of the pure copper specimen during the deformation at 573 K was smaller than that during the room temperature deformation. On the other hand, the Cu–Zn alloys showed comparable dislocation multiplication at room temperature and 573 K. The crystallite sizes determined from the line–profile analysis suggested that the crystallites of the pure copper specimen became finer with increasing dislocation density, while crystallite was not formed in the Cu–Zn alloy specimen deformed at 573 K. In addition, in the Cu–Zn alloys, although the dislocation density at 573 K was comparable with that at room temperature, the texture evolved by dislocation motion was weakened at 573 K. Those suggests that dislocation motions are suppressed in Cu–Zn alloys. Transmission electron microscopy observations confirmed that completely different dislocation substructures were formed in the deformed Cu–Zn alloy at room temperature and at 573 K. The dislocation substructure formed by the room–temperature deformation was a Taylor lattice in which dislocations accumulate on planar slip planes, whereas in the 573 K deformation, the dislocations are randomly distributed in a wavy form and do not form tangle. The mobility of dislocations is reduced by the interaction between solid solution elements and dislocations in the Cu–Zn alloys at 573 K.
正	Pure copper and Cu-30 mass% Zn (Cu-Zn) alloy were subjected to tensile deformation at room temperature (approximately 298 K) and 573 K. Dislocation multiplication and motion during deformation were analyzed using neutron diffraction line-profile analysis. For the pure copper specimens, the dislocation density during deformation at 573 K was lower than that at room temperature. In contrast, the Cu-Zn alloys exhibited comparable levels of dislocation multiplication at both temperatures. Line-profile analysis revealed that the crystallites in the pure copper specimens became finer as the dislocation density increased, while the crystallite size of the Cu-Zn alloy specimens deformed at 573 K was considerably large and beyond the range that can be evaluated by the line-profile analysis. In the Cu-Zn alloys, although the dislocation density at 573 K was comparable to that at room temperature, the texture evolved by dislocation motion was weakened at 573 K, suggesting suppressed dislocation motion under these conditions. Transmission electron microscopy observations further demonstrated distinct dislocation substructures in the Cu-Zn alloys deformed at room temperature and 573 K. At room temperature, a Taylor lattice structure was observed, characterized by dislocations accumulating on planar slip planes. In contrast, at 573 K, dislocations were randomly distributed in a wavy form without forming tangles. This behavior suggests that the mobility of dislocations is reduced owing to interactions between solid solution elements and dislocations in the Cu-Zn alloys at 573 K.