known value of $K_1 = p_{H_2O}/(p_{H_2} \cdot a_O)$ in pure iron, the activity of oxygen in the alloy was obtained. Vanadium decreases the activity coefficient of oxygen, the logarithm of the latter being proportional to the concentration of vanadium.

A deoxidation diagram is presented in which two lines show respectively the percentage and the activity of oxygen in the alloy. Each line shows a change in slope at approximately 0.17 pct V. Above this concentration the solid phase is V_2O_3, and below it is FeV_2O_4.

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Technical Note

"Oriented Growth" in Primary Recrystallization

by Joseph J. Becker

RECENTLY the "oriented growth" hypothesis of recrystallization textures has been receiving considerable attention. According to this view, "whenever a new generation of grains is growing in a highly oriented matrix . . . one may assume . . . that from among available nuclei of a great variety of orientations those with suitable orientation relationship with respect to the matrix have by far the highest rate of growth (oriented growth) and will, therefore, predominate."[1] This statement includes primary recrystallization of single crystals and of polycrystalline materials showing strong deformation textures as particular cases. While the phenomenon of oriented growth undoubtedly does operate, and may be of importance in coarsening or secondary recrystallization, the writer feels that its extension to primary recrystallization is a different matter. Several aspects of this phenomenon may be pointed out which are difficult to rationalize on the basis of oriented growth.

In recrystallizing deformed single crystals of alpha brass, Maddin, Mathewson, and Hibbard[2] found that the twin composition planes of the recrystallized grains were parallel to the three operative slip planes they observed, and not to the fourth octahedral plane. The writer's current work seems to indicate further that when only one or two slip systems can be seen to operate, the recrystallized grains are aligned only with those slip planes actually observed. This behavior could hardly be accounted for by oriented growth, because on the latter basis the recrystallized texture of a deformed single crystal should certainly have the same symmetry as the crystal itself. Growth rates could not be expected to distinguish between crystallographically equivalent directions, unless the presence of a visible slip system vastly increases the growth rate in the appropriate direction. This seems unlikely.

JOSEPH J. BECKER, Junior Member AIME, is with the Research Lab., General Electric Co., Schenectady, N. Y.
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These relationships were observed by the writer only when considerable care had been exercised before annealing to etch away the effects of cutting out the centers of tensile specimens with a jeweler's saw and to etch off the ends of compression specimens. When these precautions were not taken, nucleation inevitably appeared to occur at the saw cuts or at the ends, and the resulting orientations never showed a [111] rotation but appeared quite random. The provision of many nuclei of many orientations did not enhance the correlation, but destroyed it.

Recrystallization textures are sometimes strongly dependent on annealing temperature, which would imply that the anisotropy of growth rates is a suddenly varying function of temperature. This might be regarded as unlikely.

Recrystallization textures can be strongly dependent on the degree of deformation. If textures are to be explained by selective growth from among nuclei of all orientations, it is difficult to see how the recrystallization process could have any dependence whatever on the manner or degree of deformation.

It is felt that the above points should be considered before the oriented growth hypothesis is applied to primary recrystallization, with the necessary complete divorce of the mechanism of recrystallization from the details of the deformation process.

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