

# Peculiarities of Fe and Co GB diffusion in Cu.

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Interest to the diffusion processes in Fe-Cu and Co-Cu systems is provoked by the recent results: absence of advanced grain-boundary diffusion (GBD) [1, 2]. The comparison of the diffusion profiles obtained by electron probe microanalysis (EPMA) method near grain boundaries and far from them (in the grain bulk) demonstrates the equality of diffusant concentration at different distances from the initial surface. To avoid the additional mass transfer during the sample preparation the diffusion study were made with 18  $\mu\text{m}$  thick copper foils. The diffusant layer (Ni, Fe, Co) was deposited electrolytically and diffusion were studied by measurement of concentration on opposite side of the foil. Concentrations were measured by EPMA near and far from the intersection of grain boundary and the surface. The grain boundaries were visualized by pre-annealing at high temperature due to Mullins' grooving.

The results in the Ni-Cu system showed advanced diffusion, the concentration near the GBD is higher than far from it. In Fe-Cu, Co-Cu systems this effect was not observed, the diffusant concentration was the same at the grain boundary and far from it at all annealing regimes.

[1] D. S. Prokoshkina, A.O. Rodin, V. A. Esin, *Phys. Metals Metallogr.* 113, 583 (2012).

[2] A. A. Itckovich, B. S. Bokstein, A. O. Rodin, *Mat. Lett.* 135, 241 (2014).