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# CRYSTAL STRUCTURE OF $\beta'$ $Cu_{0.75}Al_{0.25}$

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The problem of crystal structure of the martensitic $\beta'$ phase of the eutectic alloy in the Cu-Al system still requires a more accurate clarification (Hunger and Dienst 1960, Tarora 1949). Martensitic phases in general are formed through small thrust (shear) deformations of the original lattice. On this basis the results of Hunger and Dienst (1960) are doubtful, since the lattice constants found by them have required a considerable reclassification. From the known lattice constants of the $\beta_1$ phase (Tarora, 1949) and the orientation relationships of the $\beta'$ phase (Wassermann, 1934) one has expected a hexagonal lattice for the martensitic phase with $a = 2.6$ Å and $c = 4.2$ Å.

By means of a GE XRD-3 goniometer and Cu-$K_\alpha$ radiation there were determined on a polycrystalline thin plate the lattice constants of the martensitic structure (see data in Table 1) to $a = 2.57$ Å and $c = 4.21$ Å. The composition of the sample (25.1 at % Al) shows that the $\beta'$ phase should be formed upon quenching and not the $\gamma'$ phase.

Transmission-electron microscopic studies (including defraction) show that the presence of fine twins in the martensite give additional defraction points. This could be a possible explanation of the results of Hunger and Dienst (1960). Our results in regard to the electron microscopic studies were published in another place.

Table 1. Comparison of the lattice constants of $\beta'$

| | Electron defraction | Röntgen defraction |
|---|---|---|
| Hunger-Dienst | a = 5.16Å | a = 5.16Å |
| | ----- | c = 6.35Å |
| This work | a = 2.57Å | a = 2.57Å |
| | c = 4.21Å | c = 4.21Å |

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## Literature

Hunger, J. and Dienst, W. (1960) Z. fur Metallkunde, p. 394.
Tarora, I. (1949) Nippon Kinzoku Gakkai-Si, p. 1.
Wassermann, G. (1934) Metallwirtschaft, p. 133.