Structure Refinement of the S-Phase Precipitate $MgCuAl_2$

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The technologically important S-phase precipitate $MgCuAl_2$ has been synthesized from the elements in a sealed tantalum tube in an induction furnace. The aluminide was investigated by powder and single crystal X-ray diffraction methods: *Cmcm*, $a = 401.19(9)$, $b = 926.5(2)$, $c = 712.4(1)$ pm, $wR2 = 0.0425$, 234 F^2 values, and 16 variable parameters. The new crystallographic data fully confirm the original work by Perlitz and Westgren [Ark. Kemi, Mineral. Geol. **16**, 1 (1943)], but the present structure refinement has led to a much higher precision. The crystal chemical peculiarities of $MgCuAl_2$ are briefly discussed.

Key words: Leight Weight Alloy, Precipitation Hardening, Crystal Structure