



SEMINAR

Structural relationships between intermetallic phases in Mg-Zn(-Y) alloys

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Science Lecture Theatre S9, Building 25

Abstract

The Mg-Zn binary system includes several intermetallic phases, from a relatively simple hexagonal Laves phase (MgZn_2) to more complex monoclinic (Mg_4Zn_7) and orthorhombic ($\text{Mg}_{51}\text{Zn}_{20}$) phases. All three phases contain similar zinc-centred icosahedral clusters, suggesting a relationship these phases and the icosahedral quasicrystalline phase formed in Mg-Zn-Y alloys.

This presentation will give a brief outline of the current technical interest in this area and the effect of binary and icosahedral phase precipitates on the mechanical properties of magnesium alloys. It will then discuss recent HRTEM studies on Mg-Zn(-Y) alloys, which found that both rod-shaped intragranular precipitates [1] and globular twin-boundary precipitates [2] were comprised of co-existing MgZn_2 and Mg_4Zn_7 phases. The structural and orientation relationships between these two phases will be examined in terms of both the unit cells of the phases and the arrangement of their constituent icosahedral clusters.

References

- [1] A. Singh, J. M. Rosalie, H. Somekawa, and T. Mukai. ,The structure of precipitates in Mg-Zn-Y alloys. ,Philosophical Magazine Letters, 2010.
- [2] J. M. Rosalie, H. Somekawa, A. Singh, and T. Mukai. ,Structural relationships among monoclinic and laves phases and transition structures in Mg-Zn-Y alloys. ,Philos. Mag., 2010. (in press)

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