

**MI 6: Special Talk: Solid State Characterisation with Positrons**

Die Positronenannihilation hat sich als Methode zur Untersuchung der Realstruktur von kristallinen Festkörpern bewährt. Positronen, die in Strukturdefekten eingefangen werden (Leerstellen, Leerstellencluster, Versetzungen, Ausscheidungen und Korngrenzen) ändern ihre Annihilationsparameter, so dass Aussagen zur Art, Dichte sowie Morphologie der Defekte getroffen werden können.

Time: Wednesday 17:00–17:30

Location: H5

MI 6.1 Wed 17:00 H5  
**Micro Structural Changes in Welded AlCuLi-Alloys by Positron Annihilation Spectroscopy, SAXS and DSC** — DANNY PETSCHKE, WALDEMAR KLAUSER, and •TORSTEN E.M. STAAB — Universität Würzburg, Fakultät Chemie, LCTM, Röntgengring 11, D-97070 Würzburg

When welding sheets of aluminium alloys, size and density of hardening precipitates are influenced by the heat input created during the process. This can result in total dissolution of the alloying elements and formation of new precipitates. Further, it can have significant effects on the strength of welded sheet at the weld line and in the heat affected zone. We investigate changes in the micro structure at

different distances from the weld nugget occurring due to the created heat by different methods: Small Angle X-ray Scattering (SAXS), giving information on size and density of precipitates, Differential Scanning Calorimetry (DSC), giving information on formed precipitates by their dissolution signal, and positron annihilation spectroscopy, being sensitive to vacancies and dislocations but also to the morphology of precipitates. We start by characterizing the base material as a reference and proceed via the heat affected zone to the weld nugget for laser welded and friction-stir welded AlCuLi-alloys (AA2198). By the use of complementary methods we obtain information on structure, kind and distribution of precipitates and correlated this with hardness measurements.