

Poster-Session

Reactive Bonding of Sputtering Targets

E. Pflug, G. Dietrich, J. Böttcher

Fraunhofer Institute for Material and Beam Technology IWS, Dresden

erik.pflug@iws.fraunhofer.de

Reactive multilayer systems (RMS) consist of at least two, sometimes three chemical elements arranged alternately in thin layers. The total thickness of an RMS varies from a few micrometers to several tens of micrometers, with individual layer thicknesses in the range of a few nanometers. If an activation energy is introduced into this system, e.g. by an ignition pulse, a self-propagating, exothermic reaction occurs. The RMS reacts within fractions of a second, releasing its enthalpy in the form of heat. This heat can be used to bond components of similar or different materials.

This joining technology is of interest, for example, in the joining of sputtering targets. Often, different materials, the target and a backplate (carrier), have to be joined together, sometimes with a high CTE mismatch. This can be done using a Ni/Al RMS with soft solder or, more recently, with a Zr/Si RMS with braze. Both types of RMS can be used as a free-standing foil or as a direct coating on the backplate.