

In-situ TEM observation of healing process in Al 6xxx based alloy

Mariia Arsenko¹, Lipeng Ding^{1,2}, Aude Simar¹, Hosni Idrissi^{1,2}

¹ *Institute of Mechanics, Materials and Civil Engineering, UCLouvain, Belgium*

² *Electron Microscopy for Materials Science (EMAT), Department of Physics, University of Antwerp, Belgium*

Damage of Al components plays a significant role in their service life. That is why self-healing strategies are being developed in order to prevent or delay critical failure. However, mass transfer in metals is a complex question related to many phenomena, such as diffusion mechanisms, precipitation growth and stability, etc. To investigate healing ability and mechanism, in-situ heating experiments have been achieved inside a transmission electron microscope (TEM). The results showed that healing starts after just one minute of heating at 400°C. Further heating leads to complete healing of damaged particles, and subsequently their dissolution and growth. A healing time of 10 minutes yielded the optimum quantity of healed particles and mechanical properties of the alloy.