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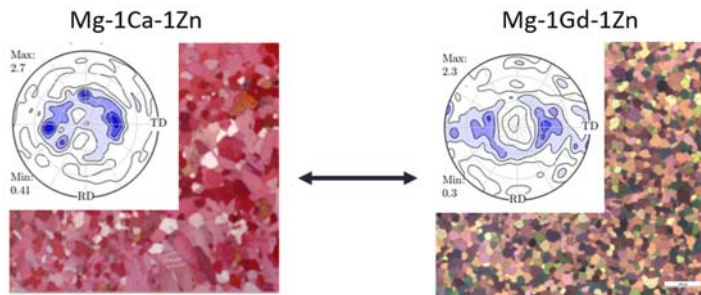
Investigation of Mg-Ca(-Zn) alloys as a substitutes for Mg-RE-(Zn) alloys

Institute for Physical Metallurgy and Materials Physics

RWTH Aachen University

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Modern automotive and aerospace applications have an increasing demand for weight and energy efficiency. Especially, Mg-alloys hold the potential to meet those requirements, but their limited formability at room temperature impedes their broad application. A prominent method to soften texture and thereby improve formability is micro-alloying with rare earth (RE) elements. They are suspected to govern the materials properties by solute segregation, caused by their large size misfit within the Mg matrix. However, as they are of limited availability and high coasts, Ca is proposed as a substitute. Mg-Ca alloys show especially in combination with Zn beneficial modifications to the texture and the mechanical properties. This study has the purpose to evaluate their microstructural evolution and modification potential compared to Mg-RE alloys.

Task: Materials characterization by uniaxial tensile tests, as well as XRD and EBSD measurement. Investigation of microstructure evolution in Mg-Ca-(Zn) with respects to recrystallization behaviour, grain size evolution and grain boundary misorientation.

What we offer:
- Experience in microstructure evaluation techniques (EBSD,XRD, tensile tests) and data analysis
- Collaboration with a young, motivated team.

The ideal candidates have:
- A high motivation for data analysis
- You have a technical, physical or mathematical background with corresponding interests and skills.

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