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Research interests:

Nano-Steels
Precipitation kinetics
Phase transformation kinetics
Critical Raw Materials
Neutron Characterization Techniques

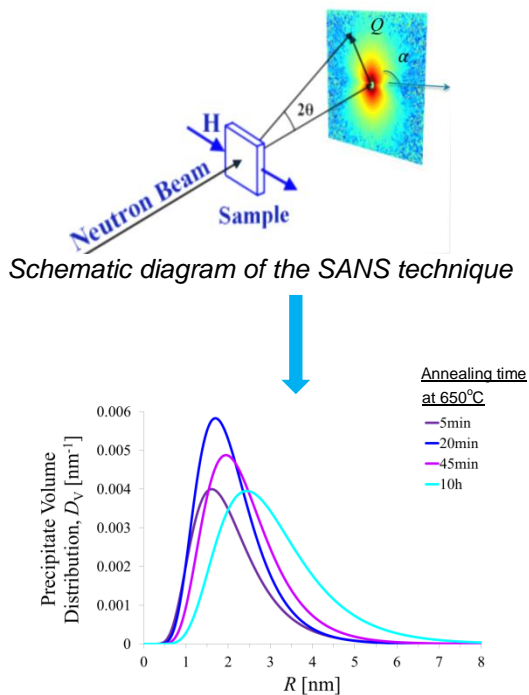
VC precipitation and $\gamma \rightarrow \alpha$ phase transformation kinetics in Nano-steels

Recent Research Activities:

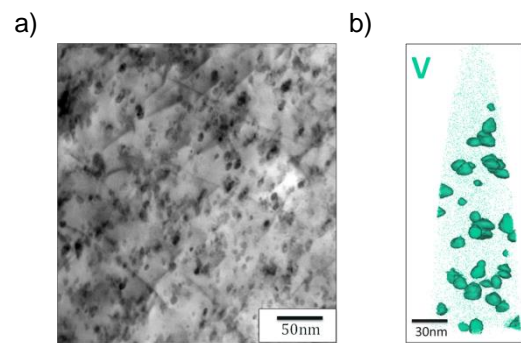
Steel consumption and CO₂-emissions can be reduced with the use of Nano-steels, developed for lightweight automotive applications.

Vanadium (V) is well-known among the different micro-alloying elements for its strong precipitation strengthening effect in ferrite. The role of V on the evolution of phase transformation and precipitation kinetics is explored.

Small-Angle Neutron Scattering (SANS) is a powerful tool for studying the precipitation kinetics in steels. By SANS, we measured the VC-precipitation kinetics in steels annealed at 650°C in the dilatometer.



Precipitate Volume Distribution calculated by SANS



a) TEM micrograph showing the precipitates in the ferritic matrix and b) APT map of V, where the VC precipitates are depicted.

The precipitate size and shape is measured by TEM and the precipitate chemical composition by Atom Probe Tomography (APT).

Other Achievements:

Conference Paper:

Interaction of VC-precipitation and phase transformation kinetics in V-microalloyed Nano-steels; Chrysoula Ioannidou, Zaloa Arechabaleta, Arjan Rijkenberg, Robert M. Dalglish, Ad van Well and S. Erik Offerman, SCT 2017, 5th International Conference on Steels in Cars and Trucks, 2017, Amsterdam.

Conference presentations:

- SCT2017, 5th International Conference on Steels in Cars and Trucks (Amsterdam, 18-22 June 2017).
- EUROMAT2017 (Thessaloniki, Greece, 17-22 September 2017).