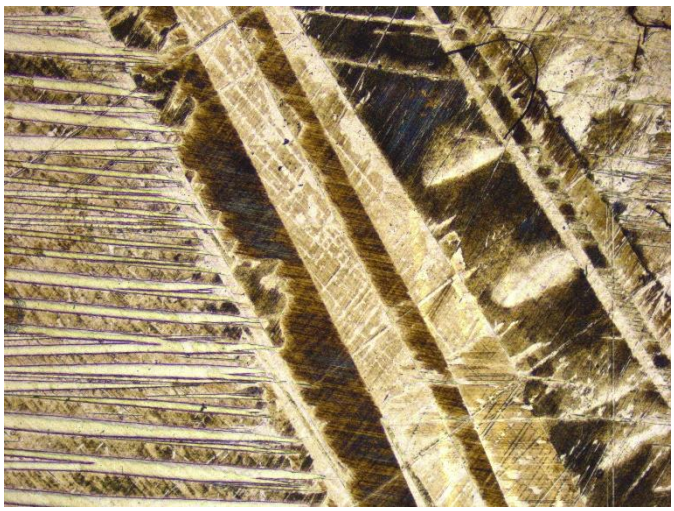
UNIVERSITÄT DUISBURG ESSEN

Offen im Denken

EMPI Institut für Energie- und Material-Prozesse

Bachelor/Master thesis

Optimisation of a basic etchant for nickel-titanium alloys



Metallographic sample preparation and examination under an optical microscope is one of the oldest methods in materials science and has lost none of its importance to this day. However, etching the polished sample to visualise micro- and macrostructural elements is still a challenge in some particularly corrosion-resistant material systems. In particular, the etching of nickel-titanium-based materials almost always requires etching agents based on hydrogen fluoride. This not only requires significantly greater effort in terms of laboratory safety and user protection, but also poses a risk to users and the environment even if all precautionary measures are observed. A safer and environmentally friendly alternative could be etching agents based on various alkalis and complexing agents. The aim of this work is a series of tests to optimise an alkaline etchant for nickel-titanium.

Tasks

- Preparation of metallographic samples (sawing, grinding, polishing)
- Systematic testing of different etchant compositions and etching times
- Detailed documentation of the results under the light microscope

Requirements

- Degree in engineering or physics
- Careful, thorough and safety-conscious way of working
- Enjoy experimental work

Contact

- Dr Alexander Kunzmann alexander.kunzmann@uni-due.de

Starting date

- Immediately or by arrangement