

Spiky Nickel Electrodes

for Electrochemical Oxygen Evolution Catalysis

by Femtosecond Laser Structuring

Felix Rieck genannt Best^a, Jürgen Koch^b, Gerhard Lilienkamp^c, Franz Körkemeyer^d, Hans Jürgen Maier^d, Jürgen Caro^a and Karsten Lange^{a}*

* Corresponding author. Tel.: +49 511 762-2942; fax: +49-511-762-19121; E-mail address: karsten.lange@pci.uni-hannover.de

^a Institute of Physical Chemistry and Electrochemistry, Leibniz Universität Hannover, Callinstr. 3A, D-30167 Hannover, Germany

^b Laser Zentrum Hannover e.V., Hollerithallee 8, D-30419 Hannover, Germany

^c Institute of Energy Research and Physical Technologies, TU Clausthal, Leibnizstr. 4, D-38678 Clausthal-Zellerfeld, Germany

^d Institut für Werkstoffkunde (Material Science), Leibniz Universität Hannover, An der Universität 2, D-30823 Garbsen, Germany

SUPPLEMENTARY INFORMATION

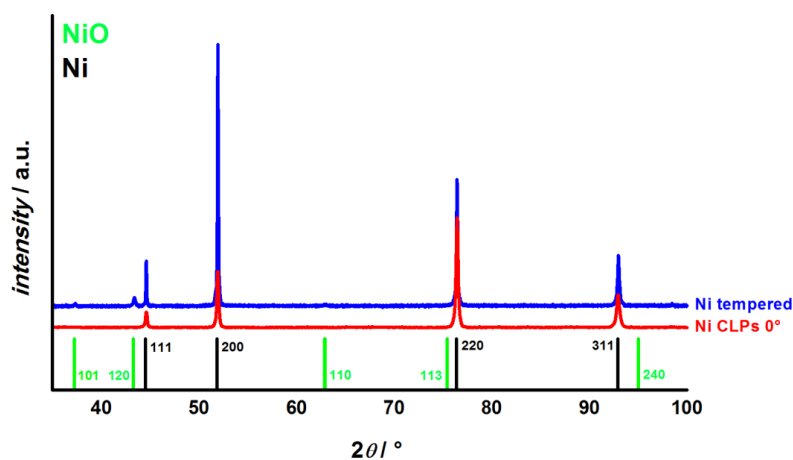


Fig. 1. X-ray diffraction patterns of laser structured Ni electrodes and tempered comparative sample of the region $30^\circ < 2\theta < 100^\circ$. Theoretical reflex position of Ni and NiO is shown with corresponding MILLER indices.

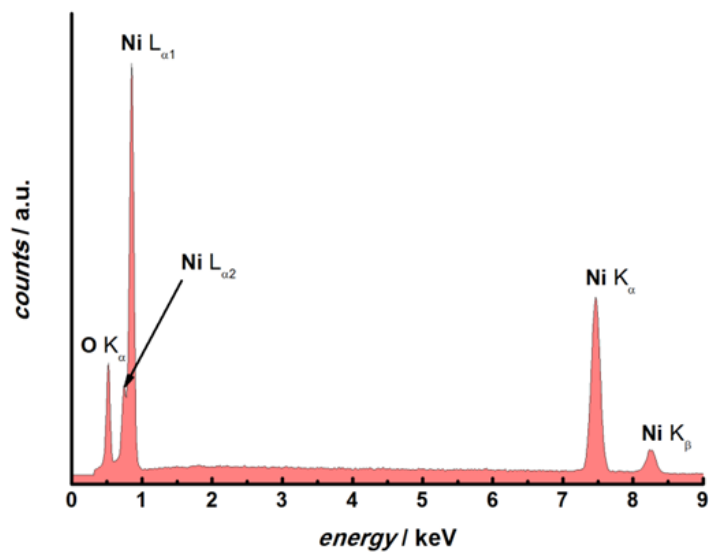


Fig. 2. Energy-dispersive X-ray spectrum of a laser structured Ni electrode.

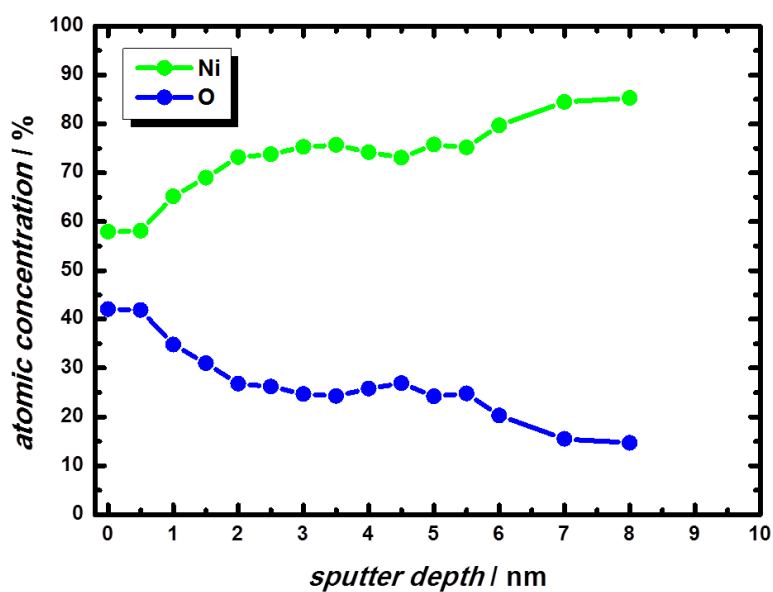


Fig. 3: Depth profile of Ni CLPs 0° with nickel oxide layer thickness of $\approx 4 - 7$ nm.

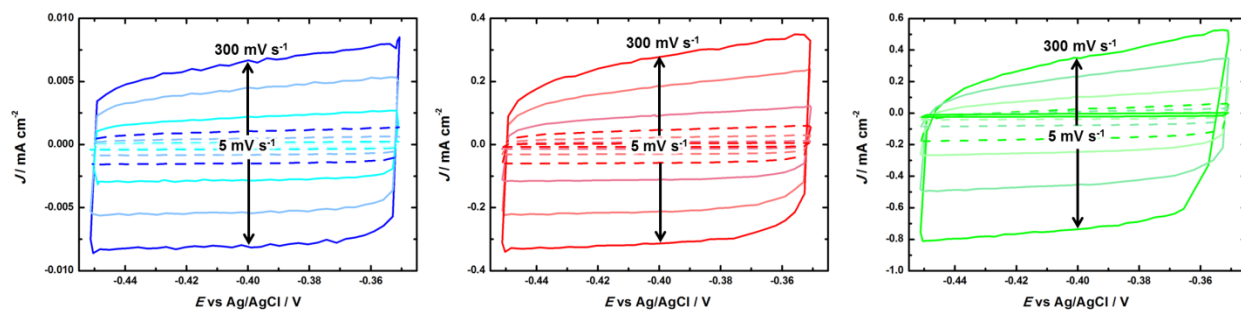


Fig. 4. Cyclic voltammogram cascades for Ni tempered (a), Ni CLPs 0° (b) and Ni CLPs 45° (c), measured with scan speeds between 5 mV s^{-1} and 300 mV s^{-1} .

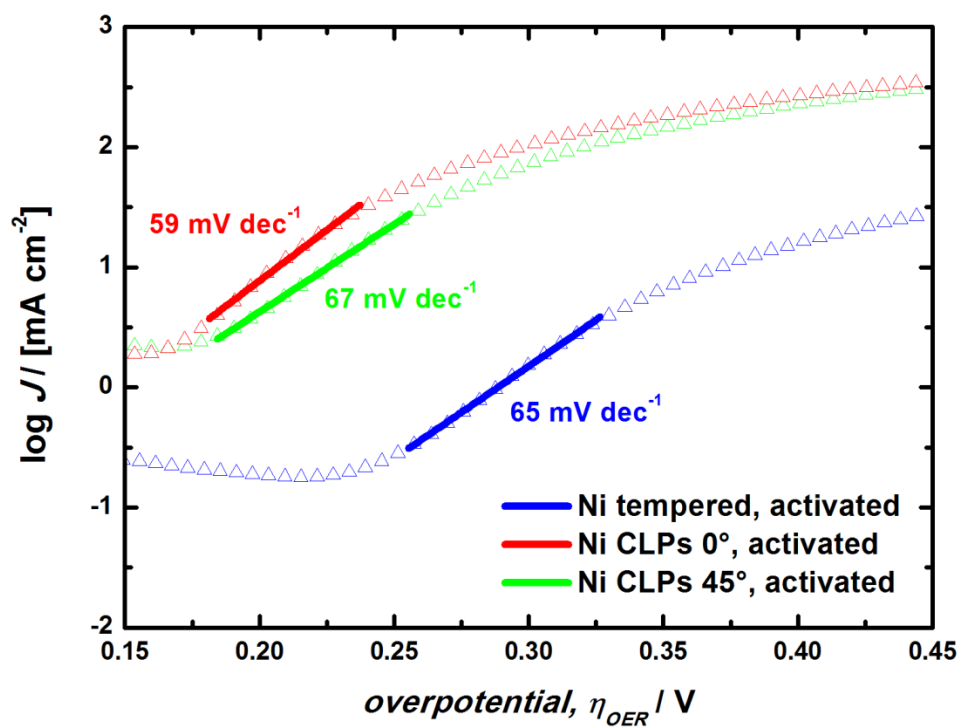


Fig. 5. Tafel plots obtained of laser structured and tempered Ni plates.

GRAPHICAL ABSTRACT

