Surface X-ray Diffraction Studies of Single Crystal Electrocatalysts

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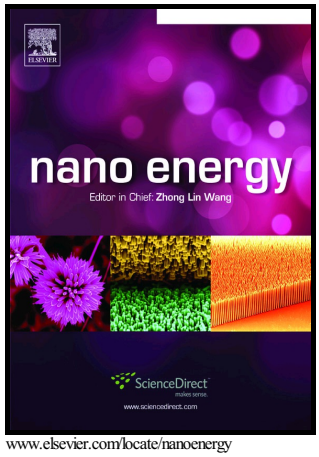

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Abstract

In this article we review the contribution of surface x-ray diffraction (SXRD) to the topic of electrocatalysis. Based on several key examples it is shown how SXRD measurements elucidate the atomic structure at the polarised solid-liquid interface which can be used to develop a fundamental understanding of specific electrocatalytic reactions. The review begins with a discussion of single crystal gold electrodes and how the interplay of different adsorbates affects the lifting and formation of the reconstruction. This has given insight into the mechanism of the oxidation reactions on Au(*hkl*) surfaces. The second part of the review highlights the results obtained on Pt(*hkl*) single crystal surfaces, specifically the information obtained from SXRD measurements regarding the adsorption and oxidation of carbon monoxide. This includes the effects of anion adsorption, metal underpotential