

Supplementary Information

On the origin of photocurrent of electrochemically passivated *p*-InP(100) photoelectrodes

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Surface cleaning by chemical etching

Prior to XPS measurements the samples were transported through air right after applied treatment with intermediate drying with compressed air in all cases. The approximate time of air exposure was 5 minutes (between the end of reaction and actual incursion to UHV chamber, $p = 8 \cdot 10^{-8}$ mbar).

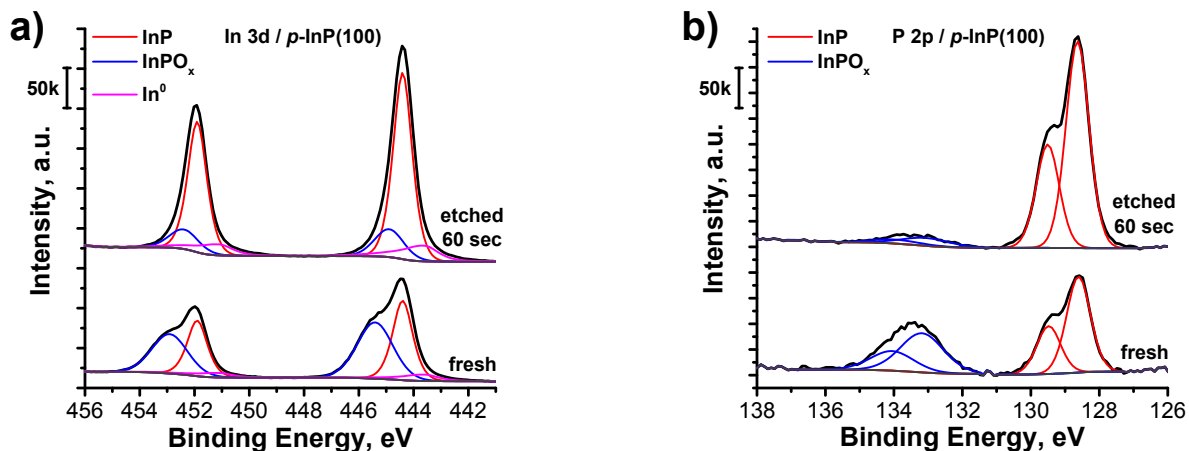


Figure S1. XPS spectra of a) In 3d and b) P 2p core levels of the *p*-InP(100) photoelectrode before and after etching in diluted H₃PO₄.

Morphology analysis

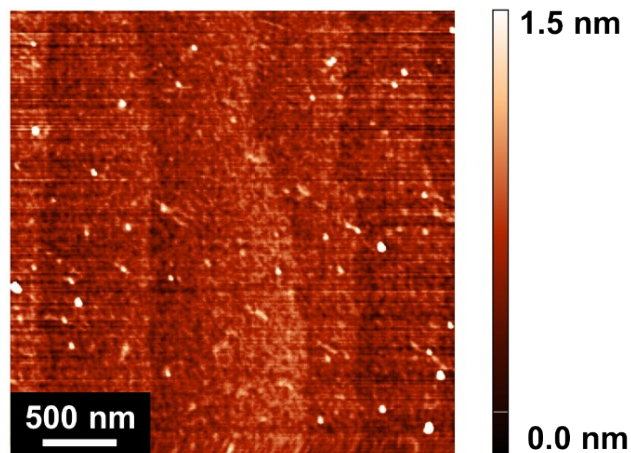


Figure S2. AFM image of the fresh *p*-InP(100) surface.

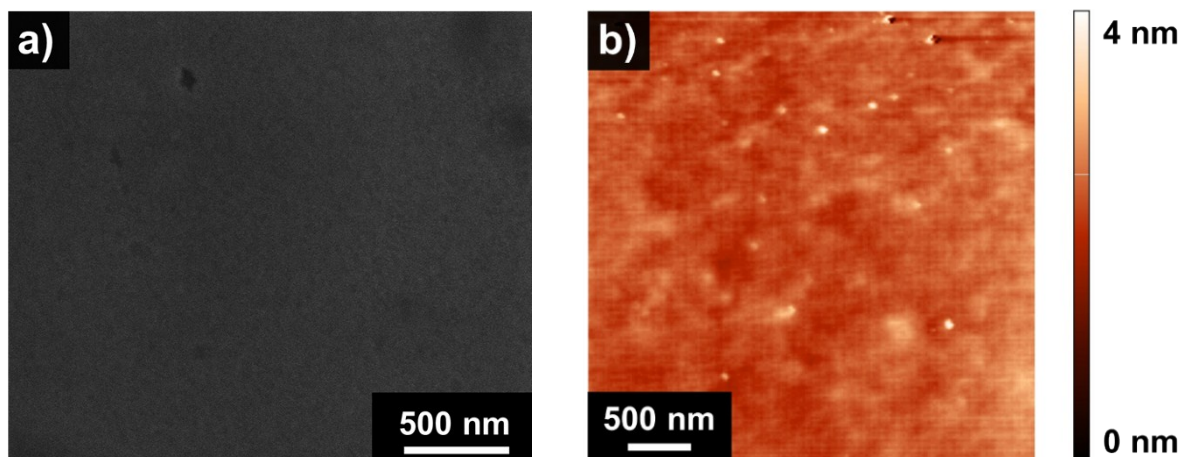


Figure S3. a) SEM and b) AFM images of the *p*-InP(100) surface subjected to continuous reduction treatment in 0.5 M H₂SO₄.

Some visible features of 50-100 nm at the upper left corner can be attributed to physical defects of the substrates generated during sample preparation and handling and should not be considered as result of the continuous reduction treatment.