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[227] Surface hydrogen concentration on metal hydrides by electron spectroscopy

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In metals that form a bulk hydride upon hydrogen exposure, the surface properties depend on the state of the bulk. This impedes the use of surface science methods in general to post mortem analysis. We have developed a method to reversibly hydrogenate thin metal films *in-situ* under conditions suitable for electron spectroscopy measurements. As a proof of concept, we measure the temperature dependent pressure-composition isotherms and the electronic structure of the titanium- and vanadium hydrogen systems. The results are discussed in conjunction with recent discoveries that substoichiometric hydrides of vanadium and titanium show catalytic activity towards ammonia synthesis.

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