A Study of the Iron Electrode for Battery Applications

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Nickel-iron (NiFe) batteries are an attractive solution for utility-scale energy storage due to a long service life, high tolerance to deep discharge and overcharge and low cost, low toxicity materials. However, the major drawback is a parasitic hydrogen evolution reaction on the iron electrode that reduces charging efficiencies.

The Scanning Kelvin probe (SKP) can be used to map the changes in Volta potential which occurs where atomic hydrogen is present in the material. The effect and mechanism of different electrolyte additions during charging of an iron electrode in 5M KOH are investigated using SKP.

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