Chemical Detection of Co Dopant Monolayer in Fe$_2$O$_3$ Photoanode

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Atom probe tomography was used to determine the 3-D distribution of Co dopant atoms in a hematite (Fe$_2$O$_3$) photo anode for water splitting. The feasibility of detecting a single monolayer of dopant was demonstrated in high-performance photoanodes fabricated at Argonne National Laboratory. This advance is significant because trace elements, which diffuse during annealing, play an important but not fully understood role in reducing the overpotential of metal oxide photoanodes.