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Trace element distributions in Al-Zn based coating alloys on steel substrates investigated by synchrotron XFM

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The 55Al-Zn-1.6Si alloy is widely used in hot-dip galvanizing to coat steel and displays a multilayered microstructure (steel substrate/intermetallic compound (IMC) layer/coating overlay) that offers protection from corrosion. Trace level (less than a few tens of ppm) V and Cr are hypothesized to influence the corrosion performance of the coated steel via localized segregation. This work investigates the distribution of trace V and Cr using synchrotron X-ray fluorescence microscopy (XFM) and scanning transmission electron microscopy (STEM), and discusses the mechanism of trace V and Cr distribution during coating formation.

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