

**The Impact of Alloy Chemistry on the Formation of a Silicon-Rich
Subscale on Two Classes of Ferritic Steels**

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Stainless steel type 441 (UNS S 44100) is being considered for application as a Solid Oxide Fuel Cell (SOFC) interconnect material. It had been thought that Laves phase that forms in this alloy preferentially consumes the Si present in the alloy microstructure, thereby avoiding formation of a Si-rich layer at the scale/metal interface. Recent work has shown this is not the case and a Si-rich layer does indeed form at the scale/metal interface. However, this layer is significantly different from the layer that forms in other ferritic stainless steels, for example, type 430. In this present work the Si-rich layer that forms on 441ss is examined and compared to the layer that forms on several 430-type alloys with varying low levels of Si. This research has shown that even at very low levels of Si (170 ppm), a Si-rich layer begins to form on the 430-type stainless steels. However, the morphology, particularly with respect to the thickness and continuity of the Si-rich subscale that forms in alloy 441ss, is modified in comparison to non-Laves forming ferritic stainless steels and therefore, may not be as detrimental to long term SOFC performance.