

Abstract Submitted
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Stability of V and Ti on Al surfaces: Searching for suitable interlayer materials to stabilize the Fe-Al interface¹ WEERASINGHE PRIYANTHA, HUI CHEN, MICHAEL KOPCZYK, KASEY LUND, DAN TONN, RICHARD SMITH, Montana State University, Bozeman, MT, PONNUSAMY NACHIMUTHU, VAITHIYALINGAM SHUTTHANANDAN, Pacific Northwest National Laboratory, Richland, WA — There is considerable interest in fabricating thin film multilayer structures with sharp interfaces for a wide variety of applications. Interface intermixing may degrade the desired physical properties of a structure, but this may be reduced in some cases using stabilizing interlayers at the interface. Model calculations predict that both V and Ti will be effective stabilizing interlayers for the Fe-Al interface, a system well known for considerable intermixing at room temperature. We have used X-ray reflectometry (XRR) and Rutherford backscattering spectrometry (RBS) to characterize bilayers and trilayers of the Fe-V-Al and Fe-Ti-Al systems prepared using dc magnetron sputtering. Our analysis revealed that Fe-Al bilayer systems showed considerable intermixing, especially when the Fe layer was deposited on top of the Al. It was also found that with V or Ti as an interlayer at the interface, the intermixing of Fe and Al was reduced.

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Weerasinghe Priyantha
Montana State University, Bozeman, MT

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