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Ti as an Interface Stabilizer for Fe/Al and Al/Fe Interfaces¹ W. PRIYANTHA, A. COMOUTH, A. KAYANI, H. CHEN, M. KOPCZYK, R.J. SMITH, Montana State University, Bozeman, MT, D. MCCREADY, Pacific Northwest National Laboratory, Richland, WA — The use of ultra-thin metal interlayers to stabilize metal-metal interfaces and to limit interdiffusion has drawn much attention over the past few years, driven by a variety of technological applications. Earlier we reported that using a Ti monolayer as an interlayer stopped diffusion at the Fe/Al(001) interface. These findings encouraged us to explore the use of interlayer structures for thin films of technological interest deposited on Si wafers at room temperature using RF sputtering. AlFe and FeAl metal layers, with and without a Ti stabilizing interlayer, were studied using Rutherford backscattering (RBS) and X-ray reflectivity (XRR). Analysis revealed that FeAl and AlFe films without a Ti interlayer on SiO2/Si wafers showed considerable Fe-Al intermixing, especially when the Fe layer was deposited on top of the Al layer. With a Ti interlayer present at the interface both AlFe and FeAl interfaces exhibited less interdiffusion.

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