

## **Characterization of Cu/Al<sub>2</sub>O<sub>3</sub> interfaces after heavy ion irradiation**

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*MATERIALS SCIENCE FORUM 248-249 (1997) 125-128*

Ion beam irradiation allows to modify the physical properties of surfaces and interfaces in materials. In this paper we focus on ion beam effects such as ion beam mixing, radiation enhanced diffusion (RED) and phase stability in Cu-Al<sub>2</sub>O<sub>3</sub> marker interfaces. Specimens were prepared by vapour deposition: a copper-film of 70 nm thickness was evaporated onto a polished single crystal alumina substrate and additionally irradiated with 150 keV Ar<sup>+</sup> ions. Film thickness and ion energy were adjusted to obtain maximum nuclear stopping power at the interface. Two ion doses were used:  $2.6 \cdot 10^{16}$  and  $7.2 \cdot 10^{16}$  Ar<sup>+</sup>/cm<sup>2</sup>. The mixing behaviour was analysed by Rutherford Backscattering spectroscopy (RBS) and X-ray Photoelectron Spectroscopy (XPS). Scanning Electron Microscopy (SEM), High Resolution Transmission Electron Microscopy (HRTEM) and Electron Energy Loss Spectroscopy (EELS) were used to obtain information about film quality and phase stability after irradiation.