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Study of Au/Cr multilayer thin-film surface morphology, structure and constituents on borosilicate glass, and quartz surfaces JOHN LAVOIE, ERIC KEMBLE, INDRAJITH SENEVIRATHNE, Lock Haven University — Au/Cr/substrate multilayer thin films have a wide area of applications in both industry and proof of concept investigations in device engineering. Borosilicate glass and quartz are used for substrate materials. Typically, Cr deposition on substrates give rise to Stanski-Krastonov (SK) like growth while Frank-van der Merwe (FM) like growth is desired in many engineering applications. A thermal evaporator is used to deposit Cr with a thickness of $\sim$ 100nm on the previously mentioned substrates. The additional Au layer is then deposited via magnetron sputter deposition at 100mtorr at low deposition rates ($\sim$ 1ML/min) onto the Cr thin film. These systems were then annealed using different temperatures for various durations. After annealing these systems were characterized via Atomic Force Microscopy (AFM) probes for surface topography and structure. Further, the ambient contamination and elemental distribution/diffusion at annealing was investigated via Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray spectroscopy (EDX).

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