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Characterization of thin film deposition processes in RF and DC sputtering using optical emission spectroscopy[1] AMRUTA NAWARANGE, HASITHA MAHABADUGE, KRISTOPHER WIELAND, ALVIN COMPAAN, University of Toledo, Department of Physics and Astronomy — We have used optical emission spectroscopy (OES) to understand sputtering processes when a Cu target is sputtered with RF or DC power. The plasma signal was collected through a quartz window of the chamber and fed through an optical fiber to a diode-array spectrometer with grating of 150grooves/mm. When the plasma is generated using DC power, the optical emission signal shows several prominent lines mostly corresponding to Cu I transitions whereas in case of RF, the plasma shows several lines corresponding to both Ar I and Cu I transitions. The sputtering rate is also found to be higher in the case of DC power. Further analysis of OES data will help us to understand these processes in planar magnetron sputtering. We will discuss these processes in detail for different target materials (Cu, Cr. Mo) and at different pressure, and power and relate these changes to excitation mechanisms in the sputtering plasma.

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