Alternative Plasma Configuration for Deposition of Films from Aluminum Acetylacetonate

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It was evaluated the possibility of using an alternative plasma configuration to deposit alumina films from the reactive sputtering of Aluminum Acetylacetonate, AAA. A capacitively coupled plasma reactor was used in the experiments; the powder of AAA was spread on the center of the electrode and the substrates were placed around it. Plasma was established from Ar and O_2atmospheres by applying pulsed DC signal to the electrode. It was investigated the effect of the plasma excitation power, P (200 to 500 W) on the deposition mechanisms, process temperature and properties of the films. Deposition rate was obtained from profilometry data. Surface microstructure was investigated by scanning electron microscopy and atomic force microscopy. The structure and composition of the films was evaluated by X-ray diffractometry, energy dispersive spectroscopy, infrared spectroscopy, and X-ray photoelectrons spectroscopy. In the imposed electrical configuration, the process temperature continuously increases with time and with P, altering deposition kinetics. Deposition rate decreases as a consequence. Films are composed of C, Al and O being their proportions dependent on P. The content of organics is progressively reduced by the growth of the oxidation degree and of the temperature, both induced by P elevation. There is transition of an organic structure containing Al inclusions to the Al_2O_3.

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