

عنوان مقاله:

Effect of voltage on the structure and electrical properties of direct current (DC) magnetron sputter-deposited copper films on glass substrate

محل انتشار:

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نویسندگان:

Sedigheh Pirsalami - *Ph.D. student, Materials Engineering Department of Materials Science and Engineering, School of Engineering, Shiraz University, Shiraz, Iran*

Seyyed Mojtaba Zebarjad - *Professor, Materials Engineering Department of Materials Science and Engineering, School of Engineering, Shiraz University, Shiraz, Iran*

Habib Daneshmanesh - *Professor, Materials Engineering Department of Materials Science and Engineering, School of Engineering, Shiraz University, Shiraz, Iran*

خلاصه مقاله:

In the present study, 200-nm thick copper films are successfully deposited on glass substrate by direct current magnetron sputtering technique. The effect of the sputtering voltage (100 V - 300 V) on the structure and electrical properties of the deposited films are studied. The composition, morphology and structure of the films are investigated by energy dispersive x-ray spectroscopy (EDAX), scanning electron microscopy (SEM) and X-ray diffraction (XRD) analysis, respectively. The results show that the crystallinity of the films increases pronouncedly as the sputtering voltage increases from 100 V to 150V. At all sputtering voltages; the films grow with their {111} planes parallel to the film surface. Higher voltages favor directional growth but the preferred {111} growth direction remains the same. The resistivity of the films sharply decreases at the voltage of 100V. Further increase in the voltage results in a slight decreasing trend in resistivity and at the voltage of 300V the resistivity reaches the value of 4.6125 Ω/sq .

کلمات کلیدی:

Thin film, Copper, Direct current magnetron sputtering, Voltage, Structure, Electrical conductivity

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