HIGH RATE DEPOSITION OF THIN FILM COMPOUNDS – MODELING OF REACTIVE MAGNETRON SPUTTERING PROCESS

ABSTRACT  Deposition of compound thin films with reactive magnetron sputtering method causes a lot of difficulties, of which the main ones are the instability of the process and decrease of the deposition rate. Computer simulations were performed using Berg’s model assumptions. Firstly, effect of basic process parameters on aluminum oxide deposition was examined, also theoretical characteristics of the deposition of Al₂O₃, AlN, TiO₂, TiN were compared. Next, the parameters for efficient deposition of titanium oxide were determined. Simulations were confirmed by the results of experimental work. The purpose of presented work was to define, with Berg’s model, mechanisms which enable deposition, in metallic mode of magnetron work, of oxides with properties near to stochiometric. Presented analysis results were compared to real process parameters observed during reactive sputtering.

Keywords: Reactive magnetron sputtering, thin films, modeling of magnetron sputtering