ABSTRACT

Development of a Two-Layer Vibration Technique for Determination of Some Mechanical Properties of Thin Films

Savi Tripathi

A two-layer vibrating reed system was developed for investigating the Young's modulus and damping of thin films. Computerisation of the test procedure, data collection and data analysis enabled greater accuracy to be achieved (improvement by 10%), and also extended the versatility of the method by enabling smaller frequency shifts to be determined and hence more film/substrate combinations to be investigated.

Representative data on Young's modulus of various metallic (silver, aluminium and copper) films as well as different factors affecting the modulus such as thickness dependence, effect of different substrates, adhesion, annealing and damping are given to show applications of the system to thin films.