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Studies of Multilayer Structure Using X-ray Double Crystal Diffraction

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ABSTRACT

The multilayer structure composed of glass film, platinum film and α - Al_2O_3 substrate has been studied by using the technique of X-ray double crystal diffraction and it was found that different glass materials result in different stresses in Pt film caused by thermal dislocation within multilayer materials. The measuring results of the thin film platinum resistor show that the stresses will induce resistance change of the device and different stress status will produce added resistance in different directions. Selecting proper glass material can make opposite stress in Pt film and opposite added resistance due to thermal dislocation. The reliability of Pt resistor has been raised with the method of this stress compensation.