

THE MAGNETIC AND DIELECTRIC PROPERTIES MICROWAVE MEASURING METHOD

E.N.Kiralyov, V.L.Kostenko

State engineering academy of Zaporozhie

Prospekt Lenina, 226, Zaporozhie, GSP 248, 330300, Ukraine

Phone: 0612-2 72 84

Introduction

Investigation of microwave absorbers and multipurpose absorbing coverings and screens needs air space microwave measurements of different substances. In the present paper proposed the impedance permeability measuring method used for microwaves in an air space.

Method's basement

The proposed method based on the solution of the complex transcendental equation system which describes the connection of permeabilities an experimentally measured reflection coefficients in most general way. Thus measuring of complex reflection coefficients allows to define permeabilities values.

A microwave from a trumpet antenna is transduced by lens into a planar electromagnetic wave (EMW). EMW reflects from a sample and returns to a waveguide. A directed detector picks out signals proportional to reflected and dropping waves. Signals are directed to ratio measurer. Its output voltage is proportional to squared sample reflection coefficient modulus.

Modulus and phase measuring processes for reflection coefficients consist of determinations of interference curves in such cases: the metal screen without the sample; the sample on the metal screen; the sample without the screen moved along the propagation.

A phase change and reflection coefficient module are determined curves displacements along the sample symmetry axis and its amplitude changes comparatively to these curves without the sample.

Conclusion

The results of the changes are quite well agreed upon the known characteristic features of the dielectric materials.