

KAWASAKI STEEL TECHNICAL REPORT

Development of AlN Substrate with High Thermal Conductivity*



Synopsis:

Aluminum nitride (AlN), an attractive candidate for the high performance substrate of the next generation, has been developed, and metallization techniques have also been advanced. High thermal conductivity AlN substrate with more than 180 W/m·K has successfully been obtained by using high purity, especially low oxygen con-

2 Technical Trend in Ceramic Substrates

2.1 Present State and Problems

Materials for IC substrates are broadly classified into

θ_D : Debye temperature

T : Absolute temperature

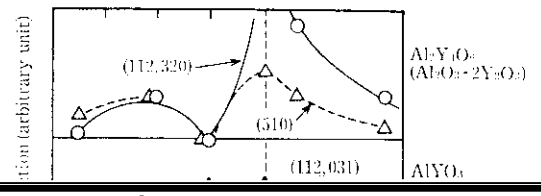
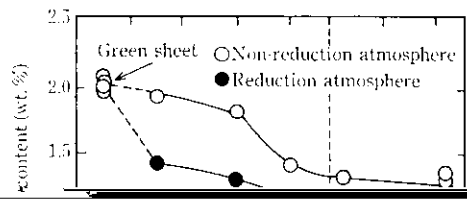
γ : Grüneisen constant

B : Constant

Substances with high $M\delta\theta_D^3$, i.e. substances having

[Microstructure]
(grain boundary/grain size)

process of AlN is described below by reference to a case
where N_2O was added as the sintering aid



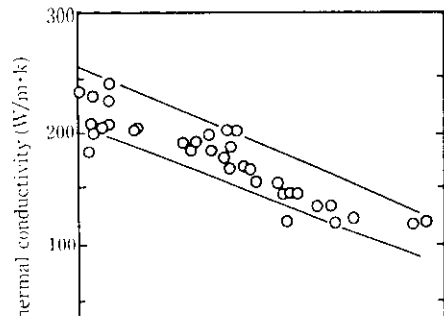
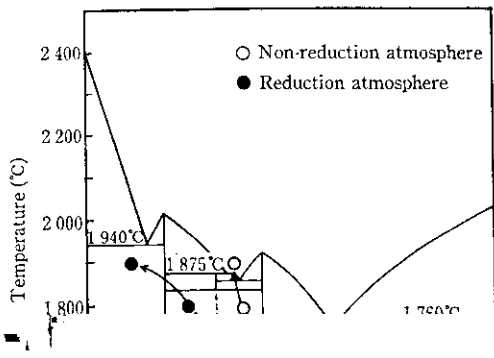
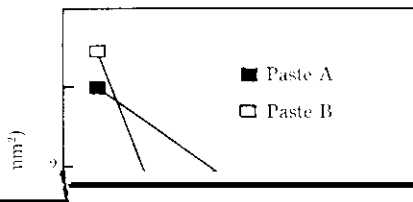




Photo 5 shows the microstructure of a sintered body produced according to a special sintering method¹⁵⁾. In

This section describes the present state and problems



6.2.3 Prospects for thick-film printing method

From the foregoing, it was determined that the thick-film printing method enables the manufacture of circuits which can be practically applied, although there is still room for improvement in both the production

