
IMPI enable the "Global Testing Center for High Temperature Dielectric Properties of Materials"

A set of test platform for measuring the high temperature dielectric properties of materials has been self-developed and established by the team of Microwave Metallurgy led by Prof. Jinhui Peng, the president of Kunming University of Science and Technology through the principle of resonant cavity perturbation method using the granular material as test objects. The measuring range of temperature, the dielectric constant and the loss tangent $\tan \delta$ is room temperature to 1400 °C, $1 \sim 100$ and $5 \times 10^{-3} \sim 1$, respectively. By using the test platform, the data of high temperature dielectric properties for more than 300 kinds of metallurgical minerals has been collected, and being used to measure the high temperature dielectric properties of minerals, chemical raw materials, organic materials, inorganic materials and biomass materials for many China's universities and microwave enterprises.

The metallurgical mineral database is established on the basis of previous testing data by the Laboratory of Microwave Power Engineering Application (LMPEA) , which is a systematic database for the fields of microwave energy applications from the molecular structure of materials to the dielectric properties of materials, including the application process of microwave energy, a lot of raw data, and application data of domestic and foreign counterparts, and the characteristics of a large number of atoms, molecules, crystals and their potential applications. We can try to investigate the new microwave processing technology using the theory and calculation simulation based on the database, elucidating the relationship between structures of materials and microwave energy using the methods of informatics, statistics and data mining, providing more information for

the expanded application of microwave energy technology. This database provides a unified data platform for researchers of microwave energy application, which can reduce the R & D cost of microwave equipments and repetitive labor, and accelerate the application of microwave energy.

IMPI enable the "Global Testing Center for High Temperature Dielectric Properties of Materials" for global peers and experts, to encourage global peers to provide samples, carrying out the testing work of parameters of dielectric characteristic using the test platform, gradually establishing the basic database for the application of microwave energy, open and shared for the global peers, eventually forming the global data center of high temperature dielectric properties of materials in the world.

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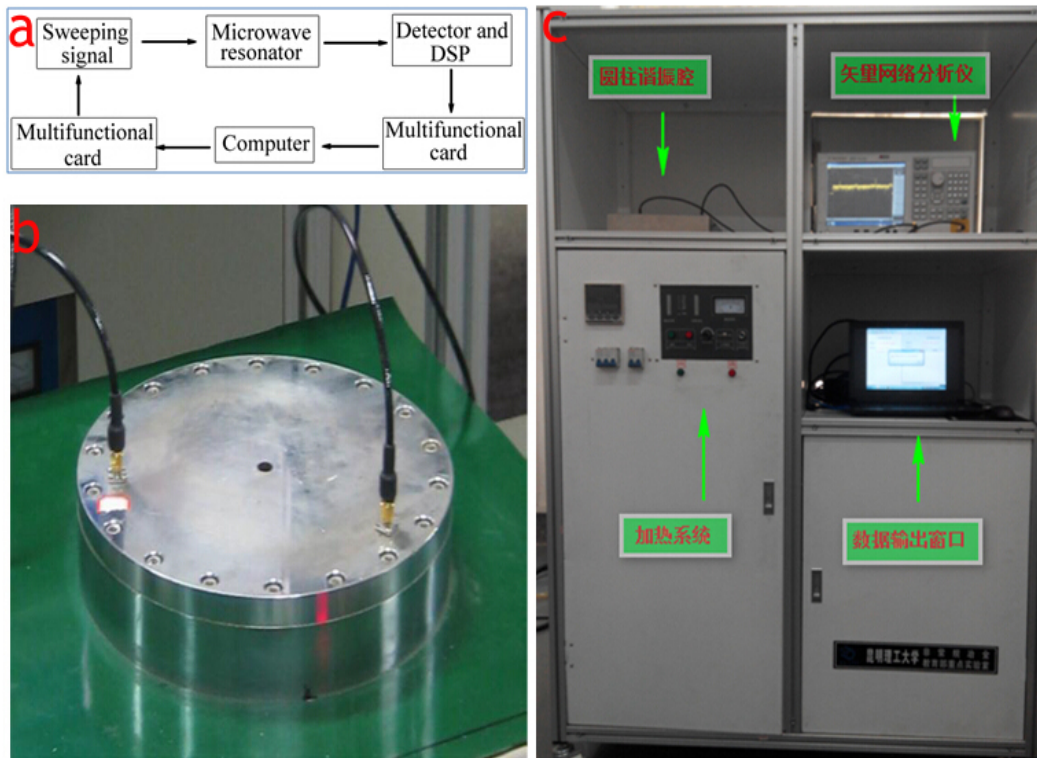


Fig.1 Test System for High Temperature Dielectric Properties of Materials



Fig.2 Database of Dielectric Properties of Materials

Dielectric Properties of Typical Metallurgical Minerals Measured by the Test Platform:

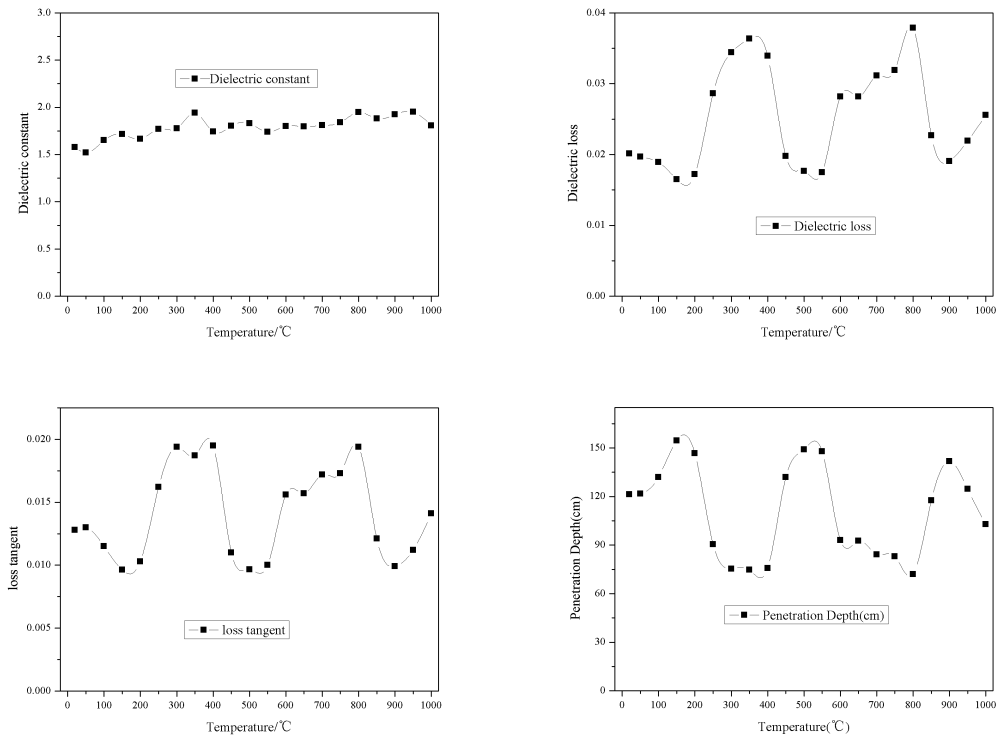


Fig.3 The change of dielectric properties of zinc oxide with temperature

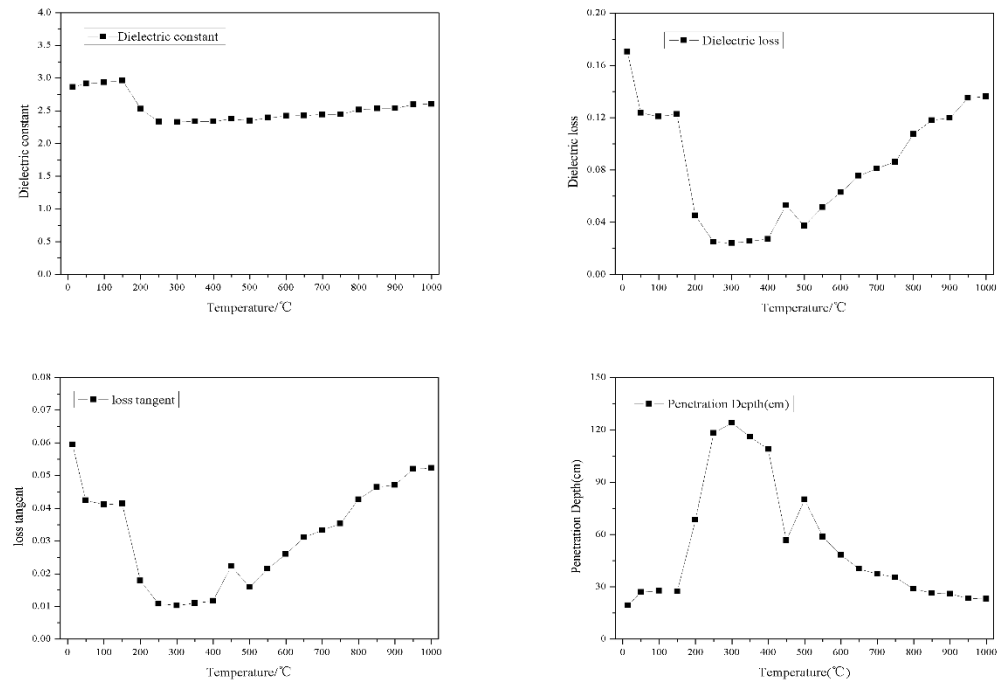


Fig.4 The change of dielectric properties of alumina with temperature

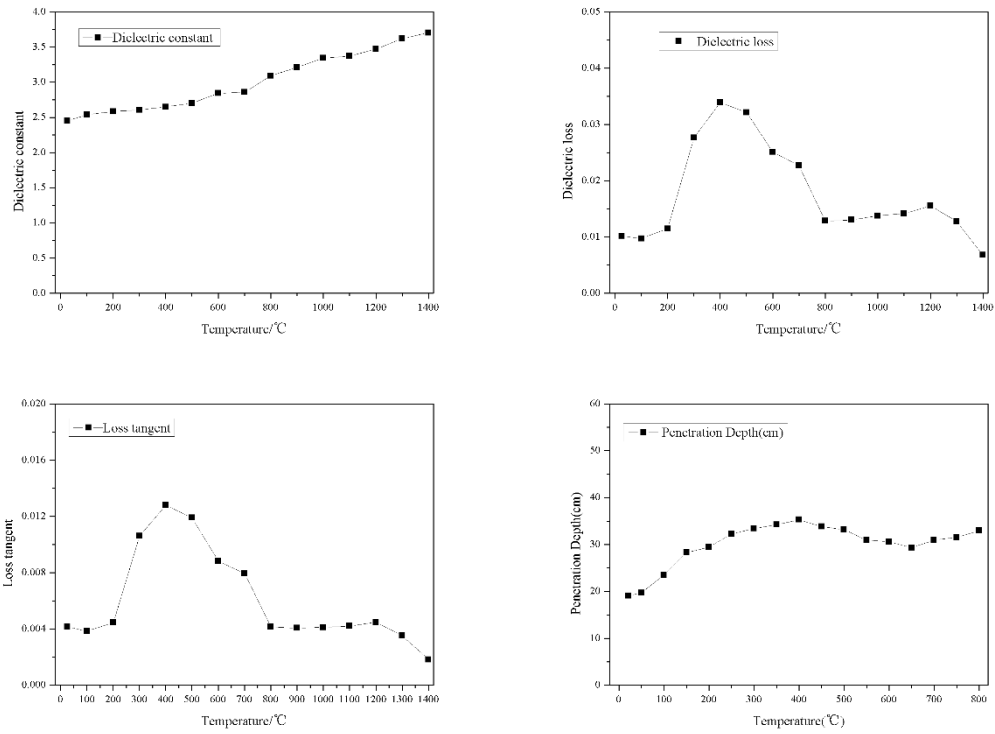


Fig.5 The change of dielectric properties of silicon dioxide with temperature

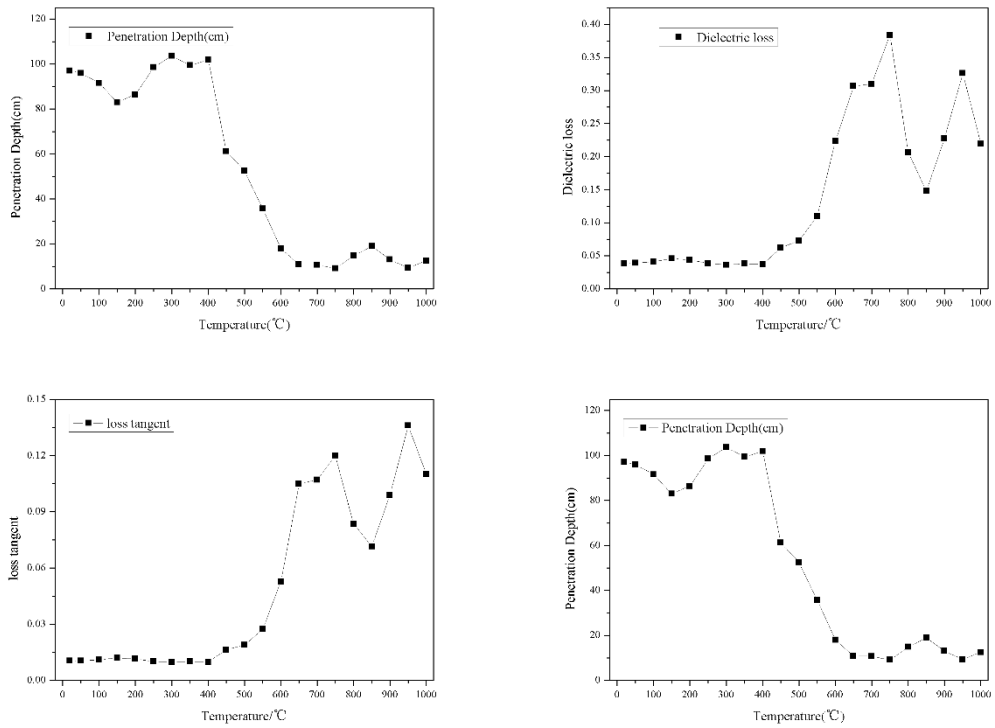


Fig6. The change of dielectric properties of siderite with temperature

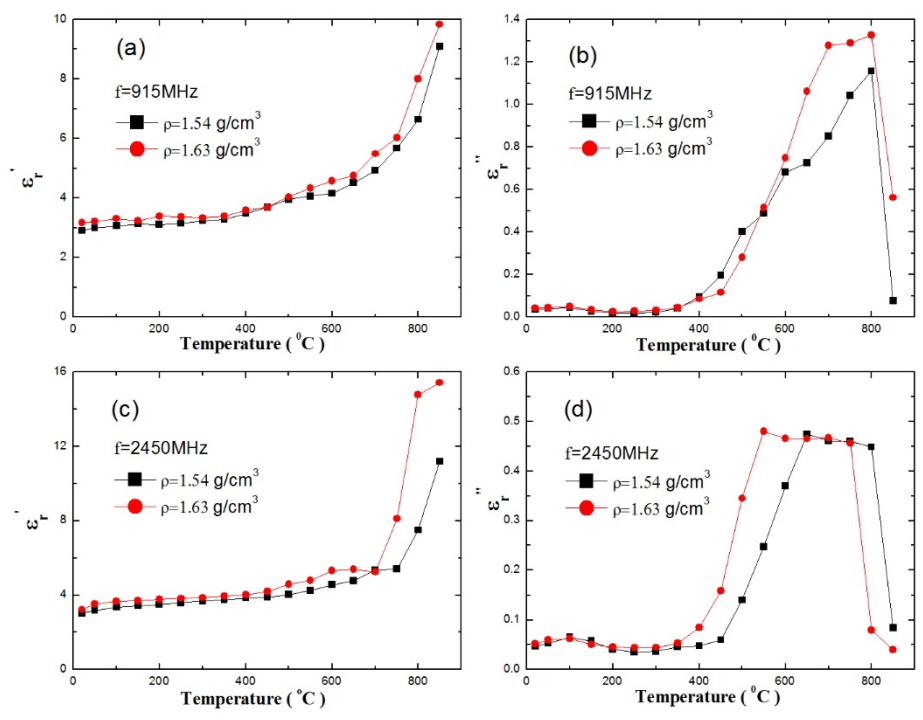


Fig. 7 The change of dielectric properties of sphalerite with temperature