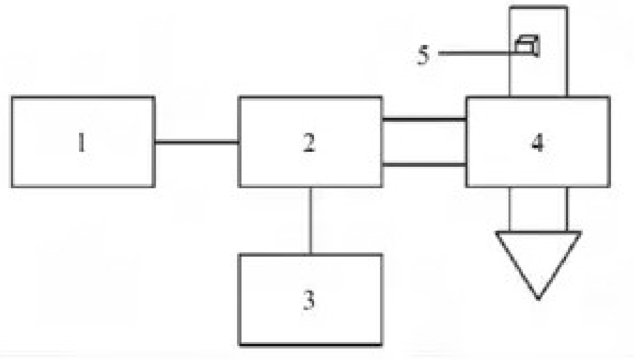
Study on microwave drying characteristics

Microwave drying characteristics of wood dielectric loss per unit volume cos 65507 One is to increase the voltage U, the two is the plus frequency f.

But the residual rate method is more economical than increasing voltage. Therefore, microwave drying equipment is widely used to dry wood, namely wood wave drying. The absorption mechanism of microwave in wood drying process now lets us use the spectroscopic point of view, the microscopic mechanism of wood drying. Wood is made from cellulose, hemifibre and lignin. They are polymer compounds with large molecular weight and degree of polymerization. Especially for wood cellulose molecules, the degree of polymerization can reach more than 100002.

The microwave drying of wood mainly removes the water content of the material, and the water is polyatomic molecules. Because cellulose is 0% in the cell of wood, we mainly discuss the molecular and water molecules of lignocellulose when exploring the drying mechanism of microwave wood.

Because the fiber molecule is a molecule and the water is a polyatomic molecule, the rotational inertia of the molecule is larger, and the coupling of the harmonic lines is more complex than that of the diatomic partition. But their absorption mechanism for electromagnetic wave energy



is still similar to diatomic molecules.

The turbulent transition of water molecules and lignocellulose molecules can be judged by the excitation level estimates of their electronic, vibrational and kinetic energy levels (a). The energy associated with the movement of valence electrons is in the same order of magnitude as the energy of an electron with a radius of a in the national orbit, and the energy of an electron with a mass of M is in the same order of magnitude as that of a molecule. Let us use the Bohr atomic model to deal with the photon corresponding to the radius of the orbital shape (6,63 x 10-) 2/(2x) 29.1 x 10 - (5,29 x 10 - (4) F = 0.2710-1 (J) = 1.69e. The frequency corresponding to the frequency is in the visible region.

In order to estimate the vibrational energy levels, we consider each normal mode as a harmonic oscillator with mass M and elastic coefficient ko. M is comparable to typical nuclear mass. It. It can be estimated that the energy changes of cattle order of magnitude corresponding to E will occur along the one-molecule scale a of a positive oscillatory displacement, because such a large displacement will certainly cause the fluctuation of electrons. That is k2NE, H. EE, /a2.