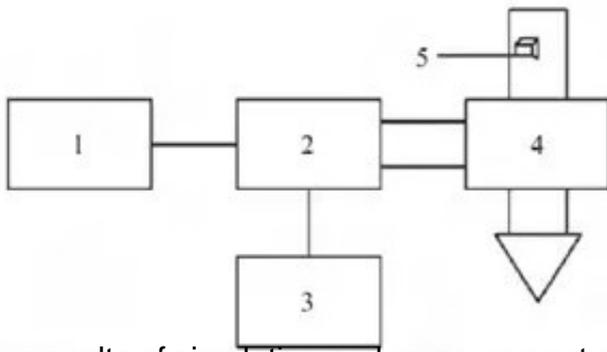


Distribution Model of Temperature and Moisture in Microwave Drying of Activated Rice

ABSTRACT: By establishing the mass and heat transfer model of continuous microwave drying of activated rice, the temperature and moisture content distribution in the [microwave dryer](#) of activated rice were obtained. The temperature and moisture models of activated rice were validated under the conditions of microwave intensity of 1.16, 2.75 and 4.34 W/g, and the correctness of the heat and mass transfer model was confirmed.



The results of simulation and measurement show that the microwave power can be controlled when the temperature rises slowly at the end of the continuous microwave dryer, and the energy consumption of microwave drying can be reduced. After the drying stage, the temperature inside and outside of the active rice material can be balanced, the drying effect is more uniform and the drying quality can be guaranteed. The research has guiding significance for microwave heating technology and control of active rice.

Key words: [microwave drying of active rice](#); temperature; moisture



The continuous microwave dryer is used to dry the active rice. The distribution and change of temperature and moisture affect the drying efficiency and quality. It is the main index for the control system of microwave dryer to control the drying process. Current research on microwave drying process mostly focuses on the microwave drying characteristics of materials and the changes of temperature and moisture depending on drying time. In the process of continuous microwave dryer entering normal operation, along the movement direction of conveyor belt in the dryer, the temperature and moisture of materials can be regarded as only changing with position and not changing with time, which belongs to the steady-state process.

According to the microwave drying characteristics of active rice, the steady-state distribution model of temperature and moisture of active rice in microwave dryer is established, which is helpful to analyze the changing trend of material temperature rising and moisture decreasing. It is an important basis for designing continuous microwave dryer suitable for drying active rice.

In this paper, the law of temperature and moisture content change in microwave drying process is studied. The law of temperature and moisture content change with distance in drying process is deduced by theoretical formula, and the theoretical model is verified by experiment.