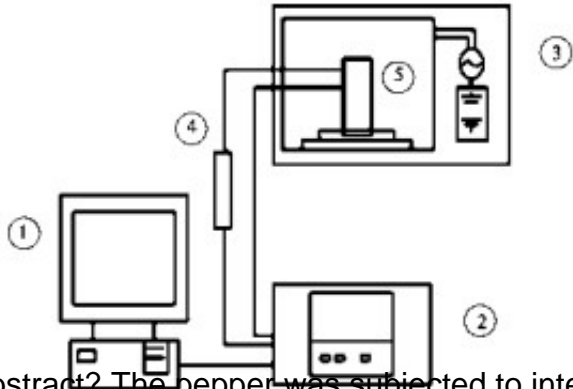


Microwave drying characteristics test of pepper

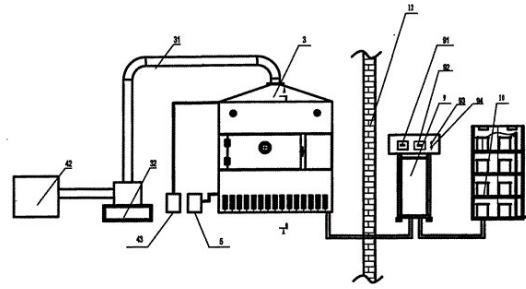


?Abstract? The pepper was subjected to intermittent drying test using microwaves with powers of 800 W, 509 W and 290 W, respectively. The quality and temperature of pepper were tested by a self-made microwave drying test system. The test results show that compared with the traditional hot air drying, the time of the [microwave drying equipment](#) is greatly shortened, but the quality of the dried pepper is not ideal, and the microwave power is higher and the quality is worse. The microwave diffusion of thin layer of pepper was fitted by single diffusion model, exponential model and Page equation. The results show that the single-diffusion model has the best fitting effect.

Key words: [pepper microwave drying](#); drying characteristics; experiment; mathematical model

introduction

Microwave drying has the advantages of high speed, high thermal efficiency, uniform heating, no pollution and no damage to the nutrients of food. It has developed rapidly in recent years. There have been a large number of research reports on microwave drying of food, rice, rapeseed, fruits and vegetables at home and abroad, and some have been successfully applied and achieved significant economic benefits. In this paper, the microwave drying characteristics of pepper were studied experimentally, and the drying law was discussed, and the mathematical



model of thin layer microwave drying was fitted.

- (1) The microwave drying process is divided into an acceleration period, a constant speed period, and a deceleration period, but the acceleration period and the constant speed period are relatively short. When the microwave power is reduced, the acceleration period and the constant speed period are prolonged, and the drying speed is also relatively slowed down.
- (2) Compared with hot air drying, the microwave drying time is greatly shortened, and the drying quality is not good. Under the test conditions, the excessive drying of some peppers and the formation of peppercorns are the main problems affecting the quality of pepper.
- (3) The preheating stage of the pepper drying curve is relatively short, and the heating time is very short. When the microwave power is 800 W, 509 W and 290 W, the acceleration process is 40 s, 80 s and 90 s, respectively. When the microwave power is below 500 W, the power has little effect on the acceleration and deceleration periods of drying.
- (4) For microwave drying of thin layer of pepper, the single diffusion model can better describe the change of water ratio with drying time and specific power.

Through the single factor experiment, when the liquid-to-liquid ratio is more than 4 m L / g, the extraction temperature is between 55-65 ° C, and the extraction time is more than 2. 5 h, the extraction rate of pecan oil is higher. On this basis, the extraction process parameters of pecan oil were optimized by L9 (34) orthogonal test.

The results showed that the pecan oil was extracted by ether extraction. The suitable operating conditions were: liquid-to-liquid ratio 5 m L / g, extraction temperature 65 ° C, extraction time 2. 5 h, extraction of pecan oil under the extraction conditions The rate is 98. 17%. The physical and chemical indicators of oil and fat are: iodine value 92. 20 g / 100 g, refractive index n₂₀ 1. 471 0, relative density d₂₀ 0. 905 6. Acid value 0.750 m g / g. The mass

fraction of oleic acid and linoleic acid is 91.13%. The mass fraction of oleic acid and linoleic acid is 91.13%.