

Uniform design method is preferred for sesame oil extraction (2)

1.1 Microwave assisted extraction



The sesame sample was weighed to 40 g, placed in a flask, and the organic solvent selected in a certain ratio was added. After being placed in a microwave oven for 40 s, it was taken out and cooled to room temperature, and the solution was carefully poured out. Add the selected organic solvent and re-inject it into the microwave for 40 s. Repeat the above steps until the radiation time accumulates to the specified time. Finally, the residue of the flask was washed with the selected organic solvent, and the resulting solution was filtered into a flask, and distilled under reduced pressure to obtain sesame oil, which was dried over anhydrous Na_2SO_4 for 24 h and weighed.

[Microwave drying machine](#)

experimental design

The four factors of extraction radiation time, solvent, microwave power and mass ratio of material to solvent were used as variables. A four-factor, three-level orthogonal test was performed. After the experimental data were processed to obtain the optimum process conditions, the sesame oil microwave extraction experiment was carried out under this condition, and the extraction rate under the optimal conditions was obtained to verify the data processing results. [Sesame oil press](#)

1.23 Ultrasound-assisted extraction

Accurately weigh 40 g of sesame sample into the flask, add the organic solvent selected in a certain ratio, soak for a certain period of time, then put it into the ultrasonic reactor for 0.5 h, remove it and cool it to room temperature, and pour out the solution. (Be careful not to pour the material out). The residue of the flask was washed with a selected organic solvent, and the obtained solution was filtered, evaporated, evaporated, evaporated, evaporated, evaporated.

experimental design

The extraction solvent, soaking time and material to solvent mass ratio were used as variables. A three-factor, three-level orthogonal test was performed (Table 2). After the experimental data were processed to obtain the optimum process conditions, the ultrasonic assisted extraction test of sesame oil was carried out under this condition, and the extraction rate under the optimum conditions was obtained to verify the data processing results.

1.34 Supercritical CO₂ extraction

Set the pressure of the separation tank I to 7 to 8 MPa and the temperature to 60 °C. The pressure of the separation tank II is 4 to 6 MPa at 35 °C. 300 g of sesame seeds were weighed and placed in a 1 L extraction tank for supercritical CO₂ extraction.

The extract was weighed every 20 min within 2 h and the extraction rate was calculated. The experimental design was carried out with three factors of extraction temperature, extraction pressure and CO₂ flow as the variables for the three-factor and seven-level uniform design experiments (Table 3). After the experimental data were processed to obtain the optimal process conditions, the supercritical CO₂ fluid extraction experiment of sesame oil was carried out under this condition, and the extraction rate under the optimal conditions was obtained to verify the data processing results.