

# Optimization of Microwave Vacuum Drying Technology for Jiangzhiling Tablets

**ABSTRACT:** Objective: To optimize the microwave vacuum drying process of Jiangzhiling tablets. **METHODS:** The microwave drying technology of Jiangzhiling tablets was optimized by Box-Behnken design-response interview with the relative density of extract, [microwave drying equipment](#) and drying time as independent variables and the total evaluation "normalization" of emodin, ursolic acid and oleanolic acid as dependent variables.

The contents of emodin, ursolic acid and oleanolic acid were determined by HPLC. The mobile phase was methanol-0.1% phosphoric acid (80:20), acetonitrile-methanol-0.5% ammonium acetate (67:12:21), and the detection wavelength was 254 and 210 nm, respectively.

**Result:** The optimum microwave vacuum drying process was to concentrate the extract to relative density of 1.27 g. mL<sup>-1</sup>, microwave power of 511 W, drying time of 27 min, and the extractions of emodin, ursolic acid and oleanolic acid were 0.321, 0.548 and 0.118 mg. g<sup>-1</sup>, respectively, which were very close to the predicted values of 0.324, 0.545 and 0.121 mg. g<sup>-1</sup>.

**CONCLUSION:** The optimized drying process is stable and reliable, and there is no significant difference in the content of index components compared with the hot air drying process. It is worth popularizing and applying in the drying process of Chinese medicinal materials.

**Key words:** [drug microwave drying](#); Jiangzhiling tablets; Box-Behnken test; emodin; ursolic acid; oleanolic acid



Jiangzhiling tablet is a kind of pure Chinese herbal extract tablet contained in the "Pharmaceutical Standards of the Ministry of Health". It is composed of Cassia seed, Schisandra chinensis, Polygonum multiflorum and hawthorn. It has the effects of tonifying liver and kidney, nourishing blood, improving eyesight and lowering lipid. It has definite effect of reducing total cholesterol and triglyceride, but it has the problems of high viscosity and difficult drying.

Microwave vacuum drying is a combination of microwave radiation technology and vacuum evaporation method, which not only retains the advantages of vacuum drying at low temperature, but also effectively overcomes the shortcomings of conventional drying such as

low heat transfer efficiency and long heating time.

At present, microwave drying technology is widely used, but there are few reports on the application of traditional Chinese medicine compound preparation. Therefore, the microwave vacuum drying process of Jiangzhiling Formula was optimized by Box-Behnken design-response interview with the extraction amount of emodin, ursolic acid and oleanolic acid as comprehensive evaluation indexes, which could provide reference for the industrialization and intelligent development of this drying method.

