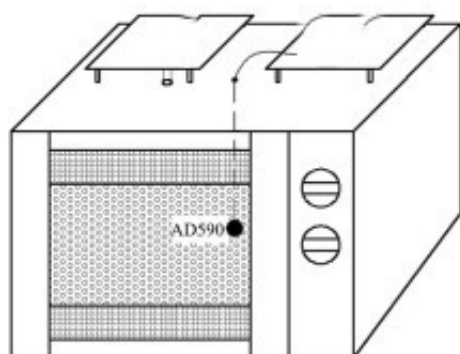


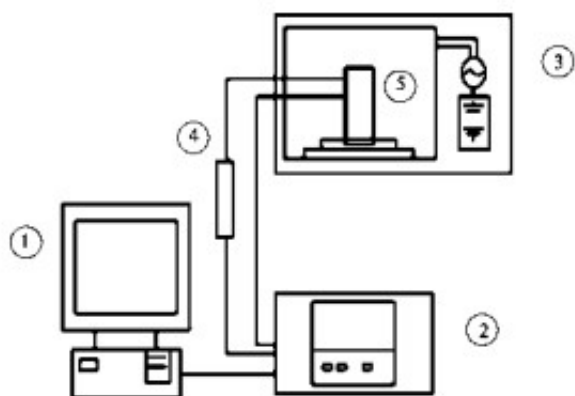
Application of Microwave Technology in Production and Research of Traditional Chinese Medicine



Schematic diagram of microwave drying temperature control system

Abstract Microwave technology is widely used in the production and research of traditional Chinese medicine. It has involved several major natural compounds such as volatile oils, glycosides, polysaccharides and flavonoids in the extraction of biologically active ingredients. In addition, microwave has been introduced into traditional Chinese medicine [microwave drying equipment](#), sterilization, processing, decoction and other aspects, with fast speed, uniform effect, energy saving, less pollution, good boiling effect, easy to achieve automatic control and good product quality, etc. Many advantages.

Key words: [microwave Chinese medicine](#); application



Microwave refers to the frequency range of $3.0 \times 10^2 \sim 3.0 \times 10^5$ MHz, extremely short wavelength (0.001 ~ 1.000 m) electromagnetic waves. Microwave has good penetrating power and penetration selectivity, can penetrate plastic, but has reflectiveness to metal, can not penetrate, can use metal as shielding device; microwave only selectively heats polar molecules, molecular pole The stronger the sex, the higher the selectivity; the microwave interacts with the substance in the high-frequency electric field with extremely short oscillation period. The strong internal heat effect and the extremely high frequency can make the solvent and the solute molecule have no thermal resistance at the same time, no thermal inertia. The ground is heated,

the heating rate is 10 to 100 times faster than the conventional heating method, and the process is easy to control because of the extremely low thermal inertia of the heating. Microwaves have abiotic effects on organisms, which can cause qualitative changes in proteins and physiologically active substances in microorganisms, and loss of biological activity or death.

Therefore, microwave has been widely studied and applied in the fields of chemical synthesis, traditional Chinese medicine production, food and the like. This paper introduces and summarizes the application of microwave in the production and research of traditional Chinese medicine.

The technology of drying and sterilizing microwaves has been introduced into the production of traditional Chinese medicines, and has also been effectively applied in the drying and sterilization of Chinese medicinal materials. Microwave drying is different from external heating methods such as hot air, steam, and electric heating. The conventional drying is heat conduction due to the temperature difference between the inside and the outside. The internal temperature is lower than the outside, the drying effect is worse than the outside, and the drying is slow and uneven. In the microwave drying, the water molecules inside and outside the material are vaporized together, and the heat conduction direction is the same as the water diffusion direction. The internal and external temperature gradients have small negative effects, fast drying speed, uniform drying effect, energy saving, easy realization of automatic control and good product quality. .

Microwave drying and sterilization technology has the characteristics of high energy utilization rate, short drying time and uniformity, strong sterilization ability and high degree of automation control. It has a broad application prospect in traditional Chinese medicine production and is worthy of promotion. Due to the impermeability of the packaging materials, some of the pieces are difficult to cause mildew and other quality problems due to the difficulty of volatilization of water. As a project promoted by the State Administration of Traditional Chinese Medicine, some Chinese medicine decoction manufacturers will microwave dry and sterilize. The technology is applied in the production of small packaged Chinese medicine decoction pieces.

What needs to be further explored is the selection of wavelengths, irradiation time, and speed of conveyor belts for different textures of Chinese herbal medicines. There are no technical parameters for standard operation, and there is still a lack of physicochemical properties and sanitary conditions of Chinese herbal medicines before and after microwave treatment. Sex research.