Application of Microwave Technology in Traditional Chinese Medicine Pharmaceuticals (1)

Microwave drying machinery technology, as a kind of technology based on the characteristics of microwave penetration, high selectivity and high heating efficiency, has been widely used in traditional Chinese medicine.

In fact, as far as traditional Chinese medicine pharmacies are concerned, they have certain specialities. They have higher requirements in the extraction of active ingredients, the processing of traditional Chinese medicines, and the drying of traditional Chinese medicine preparations, and microwave technology. It is based on such a demand.

Therefore, in order to present this microwave dryer technology to the readers in a clearer and more systematic way, this paper will focus on the central theme of the application of microwave technology in traditional Chinese medicine, from microwave technology. Based on the technical principle, the application of Chinese medicine extraction, Chinese medicine processing and drying sterilization is discussed and analyzed.

Nowadays, as a powerful continuation of traditional Chinese medicine, traditional Chinese medicine has gradually occupied a very important position in the modern medical process. However, in terms of the maintenance of this important status, its concrete realization is not an easy task. Because the characteristics of traditional Chinese medicine have directly led to the need for complicated pharmaceutical procedures in the actual pharmaceutical process, and the quality of such procedures has actually determined the safety of the finished Chinese medicine products to a large extent. Usability.

Of course, in order to fully cope with this problem, the corresponding technology is gradually introduced, and the microwave technology with unique performance advantages is a good example, which can be applied to the actual process of the whole traditional Chinese medicine pharmaceutical. Through the relevant aspects, this paper analyzes and discusses the application of microwave technology in traditional Chinese medicine, which has high practical significance.

First, the principle of microwave technology

By killing the bacteria by causing the microorganisms to produce non-biological effects and thermal effects, the purpose of sterilization is achieved. Due to the action of the alternating high-frequency electromagnetic field, a large amount of heat is generated inside the plant cells, which causes the vacuole to swell, causing the effective component cell fluid in the cell wall to flow out and be compatible with the solution, and rapidly diffuse as the temperature rises.

In addition, due to the strong penetrating power of the microwave, the speed of cell wall breaking is accelerated, and the leaching of the active ingredients in the plant cells is accelerated, and the purpose of extraction is achieved. In addition, microwave has the following characteristics: good penetrating ability; strong internal heat effect; non-biological effect on living organisms, and can use it to kill various microorganisms to achieve the goal of sterilization; easy to control, because microwave is an exchange The high-frequency electromagnetic wave, its function is related to the current, and its power density is regulated, so it can control the time, temperature and time of the microwave.

Second, the application of microwave technology in the extraction of traditional Chinese medicine

The extraction of traditional Chinese medicine is a very important part of the whole process of traditional Chinese medicine, because in terms of traditional Chinese medicine, its specific therapeutic effect is its internal action component, and this ingredient is contained in the traditional Chinese medicine. In this way, it requires us to take effective measures to refine the medicine.

Mechanical or chemical methods are very difficult to break the wall of the medicinal material in which the active ingredient is embedded in the inner thin-walled cells or liquid cells protected by hard or soft skin, and it is difficult to achieve the desired crushing effect. Microwave heating causes polar substances in the cells, especially water molecules, to absorb microwave energy and generate a large amount of heat, so that the intracellular temperature rises rapidly and

the pressure generated by the vaporization of liquid water breaks through the cell membrane and the cell wall to form tiny pores.

Further heating of the microwave leads to a decrease in the water inside the cell and in the cell wall, the cell shrinks, and cracks appear on the surface; and the presence of pores or cracks enables the extracellular solvent to easily enter the cell to dissolve and release the intracellular product.

Microwave technology is often used for the extraction of active constituents of traditional Chinese medicine. It has the advantages of low energy consumption, short operating time, low solvent consumption, high selectivity and high target composition. The microwave technology was applied to the extraction of clove oil, compared with the solvent reflux extraction and steam distillation extraction. The results showed that the microwave extraction was more selective than the solvent reflux extraction method, and the yield was higher than the steam distillation method and the energy consumption was low. Save time and solvent consumption.

Microwave technology was applied to the extraction of free rhubarb from rhubarb. The optimal leaching scheme of rhubarb was optimized by orthogonal test. Results: The extraction efficiency of rhubarb obtained by microwave extraction was significantly better than that of conventional decoction, with 95% ethanol. The reflux extraction method is equivalent. Fan Zhigang et al. also used orthogonal test of microwave output power, medicinal material particle size and leaching time to optimize the optimal leaching scheme of flavonoids in Xuelian and compare the flavonoids content in Xuelian leaching solution by ultraviolet spectrophotometry.

Results: The leaching amount of flavonoids extracted from snow lotus by microwave method was obviously better than that of conventional decoction method. The fine powder of medicinal materials did not aggregate, did not gelatinize, and overcome the defects of easy aggregation and easy gelatinization of powder. The extraction of baicalin from Astragalus by microwave method requires short time and good parallelism, and the extraction rate is nearly 10% higher than that of ultrasonic method.

The flavonoids extracted from Ginkgo biloba leaves by microwave method, the optimum extraction process of Ginkgo biloba leaf flavonoids was 18.8% higher than that without microwave treatment. Chen Bin et al. extracted the total isoflavones from Radix Puerariae by microwave, and the leaching rate was over 96%. Compared with traditional hot dip extraction, it not only has high yield, high speed and energy saving. Pare et al. have also succeeded in using microwave technology to extract volatile oil.