MICROWAVE-ASSISTED EXTRACTION OF ESSENTIAL OIL FROM CINNAMON AND CLOVE WOODS

ABSTRACT

Cinnamon oil and clove oil are usually obtained from conventional refining and certainly require a long time of extraction. One of the newest methods that can be used for extraction is microwave. The advantage of microwave is its ability to provide energy all material directly, hence it can reduce time compared to conventional extraction methods. This research aims to study the time influence, weight material and solvent ratio, microwave power, and the type of methods to the essential oil yield obtained. Water is used as a solvent since it is polar, so it is very favorable to absorb microwaves. Variables of research are cinnamon and cloves, cinnamon weight of both wood and cloves are 50, 75, 100, 125, 150 grams, the microwave power used was 264, 400, 600 W. While the volume of solvent at 400, 450, 500 ml. Operating conditions in both extraction methods on two types of wood is at atmospheric pressure.

The result of research showed that the use of the microwave method is able to improve the yield and reduce the time of essential oil extraction. The microwave method only takes 60-180 menit compared with the conventional method to obtained the same amount of yield. Cinnamon oil obtained from extraction with microwave has a yield 0.344% - 0.90% higher than the conventional extraction that has yield 0.20% - 0.40%. The extraction of essential oil from clove woods obtained the yield on the microwave method has obtained 2.53% - 4.09% compare to the conventional method has obtained yield only 1.69% - 2.08%. Effect of weight ratio (mass/volume) to yield have optimum conditions of extraction with microwave. The highest yield was obtained for the extraction of cinnamon 0.90% on the weight 125 grams with a volume 450 ml solvent and 600 watts of power. For essential oil from twig cloves, highest yield was obtained at 4% on the weight 150 grams with a volume 500 ml and 600 Watt power.

Keywords: essential oils, microwave, cinnamon, cloves wood