

Kinetics and Thermodynamics of Peppermint Oil Extraction from Peppermint Leaves

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ABSTRACT

This work aims to study extraction of essential oil (EO) from peppermint leaves using hydro-distillation methods. The peppermint oil extraction with hydro-distillation method studied the effect of the extraction temperature on the yield of peppermint oil. Besides, it also studied the kinetics during the extraction process. The second-order mechanism was adopted in the model of hydro-distillation to estimate many parameters such as the initial extraction rate, capacity of extraction, the constant rate of extraction at various temperatures and activation energy. The results showed that the extraction process is a spontaneous process, since the Gibbs free energy has a negative value at all studied temperatures. For example the Gibbs free energy at (70, 80, 90, and 100 °C) were (-2.93, -3.84, -4.75, -5.66) respectively.