Extraction and mass transfer study of Cupressus sempervirens L. oil by hydro-distillation method

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ABSTRACT

The extraction of Cupressus sempervirens L. or cypress essential oil was studied in this paper. This cypress oil was extracted by using the hydro-distillation method, using a clevenger apparatus. Cupressus sempervirens L. leaves were collected from Hit city in Al-Anbar province – Iraq. The influences of three important parameters on the process of oil extraction; water which used as a solvent to the solid ratio (5:1 and 14:1 (ml solvent/g plant), temperature (30 to 100 C) and processing time, were examined to obtain the best processing conditions to achieve the maximum yield of the essential oil. Also, the mathematical model was described to calculate the mass transfer coefficient. Therefore, the best conditions, that were obtained in this study, were at 4hr as a reaction time, the temperature of about 100 C, solvent to solid ratios of 10:1 ml solvent/g plant. The volumetric mass transfer coefficient at ratios 10:1 and 14:1 solvent to solid ratio were 0.017 and 0.007 min1 respectively. Thus, it took less time to extract the Cupressus Sempervirens L. oil by using the 10:1 compared to using 14:1 solvent to solid ratio. The composition compounds of extracted C. sempervirens L. essential oil was analyzed and identified by Gas Chromatography Mass Spectrometry (GC-MS).