

NUMERICAL MODELING AND EXPERIMENTAL STUDY OF SOLAR DRYING OF THE GREEN MINT LEAVES (MENTHA VIRIDIS)

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ABSTRACT Medicinal and aromatic plants and particularly green mint (*Mentha viridis*) have a great importance for chemistry perfuming, confectionery and medicines. The present work deals with the dehydration of this plant largely produced and consumed in the south and south west of Algeria. This work was mainly concerned with the study of the drying of this plant and to develop the energy used to dry it.

In order to develop a calculating code that permits to simulate solar drying in a forced convection of this species, an experimental determination of sorption isotherms has been led with the help of the solutions method of saturated salts. Sorption curves thus obtained are then approached by empiric and semi empiric models used in a numerical model of drying.

Another experimental study is devoted to the drying kinetics determination, both in controlled conditions and in a solar dryer. The mass loss curves and the influence of the temperature and drying air flow rates are studied to determine the Drying Characteristic Curve (D.C.C.), and therefore the empiric correlation expressing the drying rate of the green mint.

After that, the two obtained correlations are introduced in a program written in FORTRAN so as to validate the experimental results of moisture content and the drying rate in terms of time for each drying modes and to study the influence of the temperature, flow rate, the hygrometry of the drying air and of the initial mass of the mint leaves on the drying rate.

The model developed in this work will permit to dimension a dryer and to study its functioning in case it is used with a solar collector, in order to define the optimal drying conditions.