(54) Title of the invention : UTILIZING STEAM DISTILLATION WITHIN A RECTANGULAR CONTAINER TO EXTRACT ESSENTIAL OILS

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(57) Abstract :
Steam distillation process to extract essential oils is an ancient method to extract essential crude oil from the plant leaves, pulp and bark. However there are very few mathematical models available in the literature. In this model the steam distillation process in a cuboid container. It is assumed that the cuboid containers have steam passed through the cuboid pipes. The mathematical model has five basic equations which are solved analytically to understand the relationships between various factors during the extraction process. These factors are expected to be: 1. Steam Temperature : The temperature of the steam used for distillation. 2. Temperature at Partial Pressure: The temperature within the container at the location where the essential oil reaches a specific vapor pressure. 3. Oil Concentration: The concentration of the extracted essential oil over time. 4. Extraction Time: The total time required to complete the essential oil extraction process. The graphs for the same are drawn to understand the interaction between temperature of the steam and temperature at the partial pressure and the concentration of the oil extracted. Further the graphs also show the relation between these and the time taken for the completion of the process. By analyzing these graphs, one can gain valuable insights into the interplay between various factors affecting steam distillation for essential oil extraction. This knowledge can then be used to optimize the process parameters (steam temperature, pressure, etc.) for different plant materials and desired oil characteristics.

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