

Libya
Ministry of Higher Education and Scientific
Research
AL Asmarya Islamic University
Faculty of Engineering



**A COMPARISON OF MICROWAVE-ASSISTED
DISTILLATION IN THE PRESENCE OF SOLVENT
(WATER) AND WITHOUT SOLVENT FOR
EXTRACTION ESSENTIAL OIL FROM THE ROSE
DAMASCENA**

**A graduation project submitted to the Chemical Engineering Department in
partial fulfillment of the requirements for the degree of Bachelor of Science in
Chemical Engineering**

BY

**MOAD ABDUL FATTAH BAKIR
MORAD SHABAN ALWALEED
MOHAMMED NOURI ALEIYAN**

SUPERVISION

MR. KHALED ABED

Zliten, Libya

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ABSTRACT

Currently, microwave-assisted extraction (MAE) is the most widely used method for extracting essential oil from several types of plants solvent free microwave-assisted extraction (SFME) is considered to provide a shorter extraction period compared to MAE in the presence of solvent, it should be an environmentally friendly approach. In this particular study, rose damascena oil was extracted using the (SFME) method and (MAE) in the presence of solvent This study aimed to investigate the effect of microwave power, extraction time and size of plants on the yield of the essential oil of ,Rose damascena. The experiment was conducted using a household microwave with microwave power rang from 140 watts to 700 watts. The maximum weight of Rose damascena petals was about 100 grams. The highest yield was obtained by (MAE) method in the presence of 0.05% solvent with 140 watts for 92 minutes of microwave heating. At a ratio of 1:3 and when using the (SFME) the weight of the Damascene rose petals was 100 grams, the highest productivity was obtained by 0.024 % at 560 watts at a time of 21 minutes.