

Microwave Accelerated Simultaneous Distillation -Extraction: Preparative Recovery of Volatiles from Food Products

Authors : Ferhat Mohamed, Boukhatem Mohamed Nadjib, Chemat Farid

Abstract : Simultaneous distillation-extraction (SDE) is routinely used by analysts for sample preparation prior to gas chromatography analysis. In this work, a new process design and operation for microwave assisted simultaneous distillation - solvent extraction (MW-SDE) of volatile compounds was developed. Using the proposed method, isolation, extraction and concentration of volatile compounds can be carried out in a single step. To demonstrate its feasibility, MW-SDE was compared with the conventional technique, Simultaneous distillation-extraction (SDE), for gas chromatography-mass spectrometry (GC-MS) analysis of volatile compounds in a fresh orange juice and a dry spice "carvi seeds". SDE method required long time (3 h) to isolate the volatile compounds, and large amount of organic solvent (200 mL of hexane) for further extraction, while MW-SDE needed little time (only 30 min) to prepare sample, and less amount of organic solvent (10 mL of hexane). These results show that MW-SDE-GC-MS is a simple, rapid and solvent-less method for determination of volatile compounds from aromatic plants.

Keywords : essential oil, extraction, distillation, carvi seeds

Conference Title : ICFEM 2015 : International Conference on Food Engineering and Management

Conference Location : Paris, France

Conference Dates : July 20-21, 2015