Author's Accepted Manuscript

www.elsevier.com/locate/talanta

Virgin Olive Oil Stability Study by Mesh Cell-FTIR Spectroscopy

Noelia Tena, Ramón Aparicio, Diego L. García-González

PII: S0039-9140(17)30257-6
DOI: http://dx.doi.org/10.1016/j.talanta.2017.02.042
Reference: TAL17318

To appear in: *Talanta*

Received date: 13 December 2016
Revised date: 13 February 2017
Accepted date: 19 February 2017

Cite this article as: Noelia Tena, Ramón Aparicio and Diego L. García-González Virgin Olive Oil Stability Study by Mesh Cell-FTIR Spectroscopy, *Talanta* http://dx.doi.org/10.1016/j.talanta.2017.02.042

Virgin Olive Oil Stability Study by Mesh Cell-FTIR Spectroscopy

Noelia Tena*, Ramón Aparicio, Diego L. García-González

Instituto de la Grasa (CSIC), Ctra. de Utrera, km. 1, Campus Universitario Pablo de Olavide - building 46, 41013 - Sevilla, Spain

*Corresponding author: Tel: +34 954 61 15 50; Fax: +34 954 61 67 90.

noelia.tena@ig.csic.es

ABSTRACT

Mesh cell is a rapid tool designed to monitor chemical changes that occurs as a consequence of oxidation at moderate conditions. In this study this accessory has been proposed for assessing virgin olive oil (VOO) stability by Fourier transform infrared (FTIR) spectroscopy. Monocultivar VOOs have been stored in mesh cells under different temperatures (at 23, 35, 65ºC) simulating the real conditions during storage and transport (<60ºC). In addition to temperature, the samples have been also stored in mesh cells at different light intensities (400, 1000, 7000 lux) to evaluate the resistance of the samples to photooxidation. The oil stability of the samples determined by using this accessory has been compared with the oil stability determined with the common methods used for this purpose (e.g. Rancimat). Despite the moderate conditions applied, mesh cell-FTIR spectra have revealed the formation of hydroperoxides and the subsequent formation of alcohols and aldehydes. Unlike other methods that require high temperature to accelerate the oxidation rate, mesh cell-FTIR has allowed differentiate the oil stability of the samples from a multi-factor perspective that includes several properties (temperature and light) and chemical species (primary and secondary