

# **ADULTERANT DETECTION IN PEPPERMINT OIL BY MEANS OF HOLOGRAPHIC PHOTOPOLYMERS BASED ON COMPOSITE MATERIALS WITH LIQUID CRYSTAL**

Wafaa Miloua<sup>a</sup>, Manuel Ortuño<sup>a,b</sup>, V. Navarro-Fuster<sup>a,b</sup>, Augusto Beléndez<sup>a,b</sup>,  
Inmaculada Pascual<sup>a,c</sup>

<sup>a</sup>Instituto Universitario de Física Aplicada a las Ciencias y las Tecnologías,  
Universidad de Alicante, P.O. Box 99, E-03080, Alicante, Spain

<sup>b</sup>Departamento de Física, Ingeniería de Sistemas y Teoría de la Señal,  
Universidad de Alicante, P.O. Box 99, E-03080, Alicante, Spain

<sup>c</sup>Departamento de Óptica, Farmacología y Anatomía, Universidad de Alicante,  
P.O. Box 99, E-03080, Alicante, Spain  
wafaamiloua42@gmail.com

Holography is an optical technique that allows the recording and reconstruction of the wave front of an object. Photopolymers are used as holographic recording materials due to their properties: high diffraction efficiency with an acceptable energetic sensitivity and flexibility with the wavelength used. Other special characteristics are added just by adding liquid crystal, such as the capacity of variation of the electro optical properties by means of an electric field.

In this work, we use a holographic dispersed liquid crystal (HPDLC) to detect a substance added as adulterant to peppermint oil. Volume diffraction gratings are recorded in two samples of HPDLC with and without peppermint oil respectively using a Nd:YAG laser tuned at 532 nm.

The adulterant is detected due to the differences obtained for the maximum diffraction efficiency, which are related to the purity of the oil.