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Effect of Temperature on Ultrasonic Signal Propagation for Extra Virgin Olive Oil Adulteration (Conference Paper)

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Abstract

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Fraud cases involving adulteration of extra virgin olive oil has become significant nowadays due to increasing in cost of supply and highlight given the benefit of extra virgin olive oil for human consumption. This paper presents the effects of temperature variation on spectral formed utilising pulse-echo technique of ultrasound signal. Several methods had been introduced to characterize the adulteration of extra virgin olive oil with other fluid sample such as mass chromatography, standard method by ASTM (density test, distillation test and evaporation test) and mass spectrometer. Pulse-echo method of ultrasound being a non-destructive method to be used to analyse the sound wave signal captured by oscilloscope. In this paper, a non-destructive technique utilizing ultrasound to characterize extra virgin olive oil adulteration level will be presented. It can be observed that frequency spectrum of sample with different ratio and variation temperature shows significant percentages different from 30% up to 70% according to temperature variation thus possible to be used for sample characterization. © Published under licence by IOP Publishing Ltd.

Indexed keywords

Engineering controlled terms: Distillation, Nondestructive examination, Temperature, Temperature distribution, Ultrasonic applications, Ultrasonic testing

Compendex keywords: Effect of temperature, Effects of temperature, Extra virgin olive oil, Non-destructive technique, Nondestructive methods, Pulse-echo technique, Temperature variation, Ultrasonic signals

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References (10)

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1 Baroni, D.B., Bittencourt, M.S.Q.
(2011) *Ultrasonic Spectral Analysis for Nuclear Fuel Characterization*

2 Calorimetry, D.S.
Detecting the Adulteration of Extra Virgin Olive Oil by Controlled Cooling DSC, pp. 3-5.

3 Dourtoglou, V.G., Dourtoglou, Th., Antonopoulos, A., Stefanou, E., Lalas, S., Poulos, C.
Detection of olive oil adulteration using principal component analysis applied on total and regio FA content
(2003) *JAOCS, Journal of the American Oil Chemists' Society*, 80 (3), pp. 203-208. Cited 48 times.
View at Publisher

4 Gupta, A.K., Sharma, R.K.
(2002) *A New Method for Estimation of Automobile Fuel Adulteration*, pp. 357-371.

5 Oliveira, P.A., Silva, R.M.B., Morais, G.C., Alvarenga, A.V., Costa-Félix, R.P.B.
Speed of sound as a function of temperature for ultrasonic propagation in soybean oil
(2016) *Journal of Physics: Conference Series*, 733 (1), art. no. 012040.
http://www.iop.org/EJ/journal/conf
doi: 10.1088/1742-6596/733/1/012040
View at Publisher

6 Sudhan, M., Gudur, R.
(2013) *Spectral Ultrasound Characterization of Tissues and Tissue Engineered Constructs*

7 Tay, A., Singh, R.K., Krishnan, S.S., Gore, J.P.
Authentication of olive oil adulterated with vegetable oils using Fourier transform infrared spectroscopy
(2002) *LWT - Food Science and Technology*, 35 (1), pp. 99-103. Cited 125 times.
http://www.elsevier.com/inca/publications/store/6/2/2/9/1/0/index.htt
doi: 10.1006/fstl.2001.0864
View at Publisher

8 Azadmard-Damirchi, S., Torbati, M.
Adulterations in Some Edible Oils and Fats and Their Detection Methods
(2015) *Journal of Food Quality and Hazrds Control*, 2, pp. 38-44. Cited 6 times.