

Author's Accepted Manuscript

Eco-friendly sonoluminescent determination
of free glycerol in biodiesel samples

Paulo Henrique Gonçalves Dias Diniz, Marcelo
Fabián Pistonesi, Mário César Ugulino de
Araújo, Beatriz Susana Fernández Band



www.elsevier.com/locate/talanta

PII: S0039-9140(13)00291-9
DOI: <http://dx.doi.org/10.1016/j.talanta.2013.04.009>
Reference: TAL13802

To appear in: *Talanta*

Received date: 9 February 2013
Revised date: 2 April 2013
Accepted date: 5 April 2013

Cite this article as: Paulo Henrique Gonçalves Dias Diniz, Marcelo Fabián Pistonesi, Mário César Ugulino de Araújo, Beatriz Susana Fernández Band, Eco-friendly sonoluminescent determination of free glycerol in biodiesel samples, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2013.04.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 Eco-friendly sonoluminescent determination of free glycerol in biodiesel samples

2 Paulo Henrique Gonçalves Dias Diniz^a, Marcelo Fabián Pistonesi^b, Mário César Ugulino de Araújo^{*a},

3 Beatriz Susana Fernández Band^b

4 ^a Universidade Federal da Paraíba, Departamento de Química, Laboratório de Automação e

5 Instrumentação em Química Analítica/Quimiometria (LAQA), Caixa Postal 5093, 58051 -970 – João

6 Pessoa, PB, Brazil.

7 ^b Laboratorio FIA, Departamento de Química, INQUISUR, Universidad Nacional del Sur, Bahía Blanca,

8 Buenos Aires, Argentina

9 *Corresponding author. Tel/Fax: +542914595100 (Ext.: 3557)

10 E-mail address: laqa@quimica.ufpb.br

12 Abstract

13 This paper proposes a flow-batch methodology for the determination of free glycerol in biodiesel
14 that is notably eco-friendly, since non-chemical reagents are used. Deionized water (the solvent) was
15 used alone for glycerol (sample) extractions from the biodiesel. The same water was used to generate
16 water-cavitation sonoluminescence signals, which were modulated by the quenching effect
17 associated with the amount of extracted glycerol. The necessarily reproducible signal generation was
18 achieved by using a simple and inexpensive piezoelectric device. A linear response was observed for
19 glycerol within the 0.001 – 100 mg/L range, equivalent to 0.004 – 400 mg/kg free glycerol in
20 biodiesel. The lowest measurable concentration of free glycerol was estimated at 1.0 µg/L. The
21 selectivity of the proposed method was confirmed by comparing the shape and retention of both real
22 and calibration samples to standard solution chromatograms, presenting no peaks other than glycerol.
23 All samples (after extraction) are greatly diluted; this minimizes (towards non-detectability) potential
24 interference effects. The methodology was successfully applied to biodiesel analysis at a high
25 sampling rate, with neither reagent nor solvent (other than water), and with minimum waste

Download English Version:

<https://daneshyari.com/en/article/7681605>

Download Persian Version:

<https://daneshyari.com/article/7681605>

[Daneshyari.com](https://daneshyari.com)