

# Author's Accepted Manuscript

Resonance Rayleigh scattering method for determination of ethion using silver nanoparticles as probe

Hooshang Parham, Sedighe Saeed



[www.elsevier.com/locate/talanta](http://www.elsevier.com/locate/talanta)

PII: S0039-9140(14)00677-8  
DOI: <http://dx.doi.org/10.1016/j.talanta.2014.08.007>  
Reference: TAL15018

To appear in: *Talanta*

Received date: 19 June 2014  
Revised date: 31 July 2014  
Accepted date: 1 August 2014

Cite this article as: Hooshang Parham, Sedighe Saeed, Resonance Rayleigh scattering method for determination of ethion using silver nanoparticles as probe, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2014.08.007>

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           **Resonance Rayleigh scattering method for determination of ethion**  
2           **using silver nanoparticles as probe**

3           **Hooshang Parham<sup>\*</sup>, Sedighe Saeed**

4           *Chemistry Department, Faculty of Sciences, Shahid Chamran University, 6135714168, Ahvaz, Iran*  
5  
6

7           **Abstract**

8           A simple, novel and sensitive method was developed to determine ethion insecticide in water  
9           samples. This method was based on the interaction of ethion with silver nanoparticles (AgNPs)  
10          and quenching of the resonance Rayleigh scattering (RRS) intensity. The change in RRS  
11          intensity ( $\Delta I_{RRS}$ ) was linearly correlated to the concentration of ethion over the range of 10.0 –  
12          900.0  $\mu\text{g L}^{-1}$ . Ethion can be measured in a short time (3 min) without any complicated or time-  
13          consuming sample pretreatment process. Parameters that affect the RRS intensities such as pH,  
14          concentration of AgNPs, standing time, electrolyte concentration, and coexisting substances  
15          were systematically investigated and optimized. Interference tests showed that the developed  
16          method has a very good selectivity and could be used conveniently for determination of ethion.  
17          The limit of detection (LOD) and limit of quantification (LOQ) were 3.7 and 11.0  $\mu\text{g L}^{-1}$ ,  
18          respectively. Relative standard deviations (RSD) for 15.0 and 60.0  $\mu\text{g L}^{-1}$  of ethion were 4.1 and  
19          0.2, respectively. Possible mechanisms for the quenching of RRS of AgNPs were discussed and  
20          the method was successfully applied for the analysis of spiked real water samples.

21          **Keywords:** Resonance Rayleigh scattering; Ethion; Silver nanoparticles

---

22          <sup>\*</sup>Corresponding author. Tel: +98 611 3360018, Fax: +98 611 3337009

23          E-mail: hoparham@yahoo.com

24

Download English Version:

<https://daneshyari.com/en/article/7679762>

Download Persian Version:

<https://daneshyari.com/article/7679762>

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