

## Author's Accepted Manuscript

A high performance potentiometric sensor for lactic acid determination based on molecularly imprinted polymer/MWCNTs/PVC nanocomposite film covered carbon rod electrode

Taher Alizadeh, Sahar Nayeri, Sahar Mirzaee



PII: S0039-9140(18)30838-5  
DOI: <https://doi.org/10.1016/j.talanta.2018.08.027>  
Reference: TAL18948

To appear in: *Talanta*

Received date: 20 May 2018  
Revised date: 2 August 2018  
Accepted date: 6 August 2018

Cite this article as: Taher Alizadeh, Sahar Nayeri and Sahar Mirzaee, A high performance potentiometric sensor for lactic acid determination based on molecularly imprinted polymer/MWCNTs/PVC nanocomposite film covered carbon rod electrode, *Talanta*, <https://doi.org/10.1016/j.talanta.2018.08.027>

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.

**A high performance potentiometric sensor for lactic acid determination based on molecularly imprinted polymer/MWCNTs/PVC nanocomposite film covered carbon rod electrode**

Taher Alizadeh<sup>1\*</sup><sup>a</sup>, sahar Nayeri<sup>b</sup>, Sahar Mirzaee<sup>a</sup>

<sup>a</sup>Department of Analytical Chemistry, Faculty of Chemistry, University College of Science, University of Tehran, Tehran, Iran P.O. Box 14155-6455, Tehran, Iran

<sup>b</sup>Department of Applied Chemistry, Faculty of Science, University of Mohaghegh Ardabili, Ardabil, Iran

\*talizadeh@ut.ac.ir; taa\_55@yahoo.com

**Abstract**

A novel nano-sized imprinted polymer/multi-walled carbon nanotube (MWCNTs)-based potentiometric sensor is introduced for lactic acid (LA) sensing in dairy products. The imprinted polymer was synthesized using allyl amine (AA) and ethylene glycol dimethacrylate as functional monomer and cross-linker, respectively. It was demonstrated that the amide linkage was created between LA and AA during copolymerization reaction which was finally hydrolyzed when removing template from the synthesized MIP. It was also shown that the MIP cavities, compatible with LA anion, were created during polymerization reaction which influenced the potentiometric response behavior of the MIP-based electrode. This novel potentiometric sensor is a carbon rod electrode, coated with a membrane consisting of the MIP nanoparticles (2.5%), MWCNTs (2%), dibutylphthalate (DBP) (65%), poly-vinyl chloride (PVC) (28.5%) and tetra phenyl phosphonium bromide (TPPB) (2%). The active ion sensed by the electrode is the LA anion formed at elevated pH condition. The sensor exhibited Nernstian slope of  $30.3 \pm 0.4$

---

<sup>1</sup> Associated Professor, Department of Analytical Chemistry, Faculty of Chemistry, University College of Science, University of Tehran, P.O. Box 14155-6455, Tehran, Iran, [Tel:098-021-61112788](tel:098-021-61112788); fax:098-0211-61112788

Download English Version:

<https://daneshyari.com/en/article/10154528>

Download Persian Version:

<https://daneshyari.com/article/10154528>

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