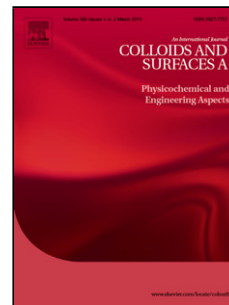


## Accepted Manuscript

Title: Study of N-isopropylacrylamide-based microgel particles as a potential drug delivery agents

Authors: M. Muratalin, Paul F. Luckham, A. Esimova, S. Aidarova, B. Mutaliyeva, G. Madybekova, A. Sharipova, A. Issayeva



PII: S0927-7757(17)30733-1  
DOI: <http://dx.doi.org/doi:10.1016/j.colsurfa.2017.07.075>  
Reference: COLSUA 21849

To appear in: *Colloids and Surfaces A: Physicochem. Eng. Aspects*

Received date: 6-2-2017  
Revised date: 25-7-2017  
Accepted date: 25-7-2017

Please cite this article as: M.Muratalin, Paul F.Luckham, A.Esimova, S.Aidarova, B.Mutaliyeva, G.Madybekova, A.Sharipova, A.Issayeva, Study of N-isopropylacrylamide-based microgel particles as a potential drug delivery agents, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* <http://dx.doi.org/10.1016/j.colsurfa.2017.07.075>

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 proof before it is published in its final 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.

# STUDY OF N-ISOPROPYLACRYLAMIDE-BASED MICROGEL PARTICLES AS A POTENTIAL DRUG DELIVERY AGENTS

M. Muratalin<sup>1</sup>, Paul F. Luckham<sup>2</sup>, A. Esimova<sup>3</sup>, S. Aidarova<sup>4</sup>,  
B. Mutaliyeva<sup>3</sup>, G. Madybekova<sup>5</sup>, A. Sharipova<sup>4</sup>, A. Issayeva<sup>4</sup>

<sup>1</sup>Tengizchevroil LLP, <sup>2</sup>Imperial College of Science, Technology and Medicine

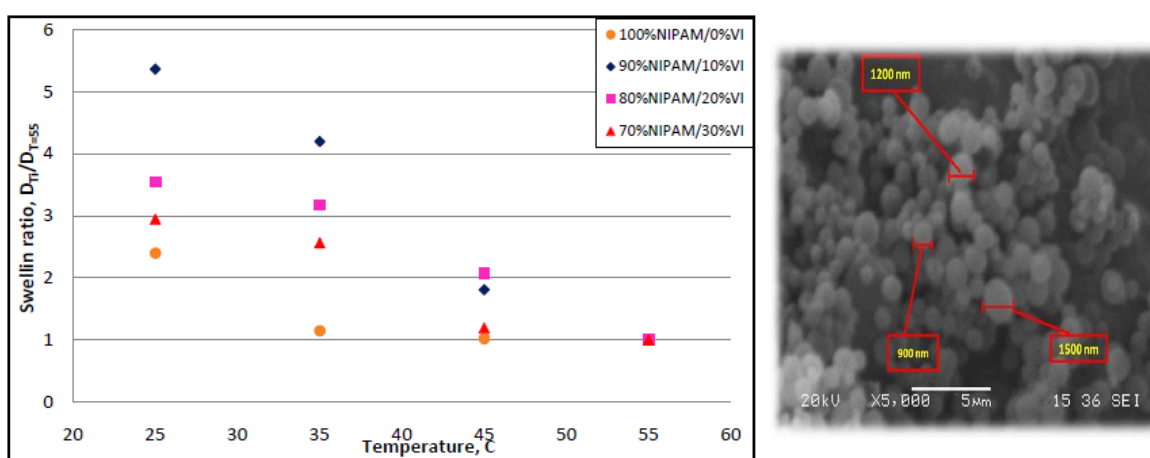
<sup>3</sup>M Auezov South-Kazakhstan State university, Shymkent, Kazakhstan

<sup>4</sup>K. Satpayev Kazakh National research Technical University, Almaty, Kazakhstan

<sup>5</sup>South-Kazakhstan State Pedagogical institute, Shymkent, Kazakhstan

\* Corresponding author at: M Auezov South-Kazakhstan State university, *Shymkent, Kazakhstan*.  
Tel.: +77011298090/+77252211989. E-mail address: [Mbota@list.ru](mailto:Mbota@list.ru) (B. Zh. Mutaliyeva).

Graphical abstract



## Highlights

N-isopropylacrylamide -based microgels were synthesized.

The particles' size as a function of temperature was investigated.

The effect of pH on size of the microgel dispersions were investigated.

The resultant microgels swelled or shrunk in response to various external stimuli.

The LCST shifted towards the temperature of human body

These materials potentially useful as a sensors or controlled release agents for drug-delivery systems.

## Abstract

This paper is devoted to the investigation of N-isopropylacrylamide-based microgels as potential drug delivery systems and other pharmaceutical applications. Surfactant free emulsion polymerization (SFEP) and emulsion polymerization techniques were employed to copolymerize PNIPAM with acrylic acid (AA), with 3-acrylamidophenylboronic acid (3-APB) and (3-acrylamidopropyl)trimethylammonium bromide (ATMA), and with 1-vinylimidazole (VI). The resultant microgel particles exhibited multi-responsive behaviour being sensitive to changes in temperature, pH. The PNIPAM-co-3-APB-ATMA microgels were sensitive to concentration of glucose, whilst the PNIPAM-co-VI microgels were sensitive to certain metals, copper in particular. The microgel containing AA exhibited characteristic temperature-sensitive behaviour with volume a phase transition temperature (VPTT) in the range of 35<sup>0</sup>-40<sup>0</sup>C and showed pH-sensitive features as

Download English Version:

<https://daneshyari.com/en/article/4981741>

Download Persian Version:

<https://daneshyari.com/article/4981741>

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