



**“Gheorghe Asachi” Technical University of Iasi, Romania**



---

## ASSESSMENT OF ELECTROCOAGULATION PROCESS. APPLICATION IN ARSENIC REMOVAL FROM DRINKING WATER

**Aniela Pop<sup>1</sup>, Anamaria Baci<sup>1</sup>, Gyongyke Wanko<sup>2</sup>,  
Katalin Bodor<sup>2</sup>, Ilie Vlaicu<sup>2</sup>, Florica Manea<sup>1\*</sup>**

<sup>1</sup>Politehnica University of Timisoara, Faculty of Industrial Chemistry and Environmental Engineering, Department of Applied Chemistry and Engineering of Inorganic Compounds and Environment, 6 V. Parvan Street, 300223 Timisoara, Romania  
<sup>2</sup>S.C. Aquatim S.A. Timisoara, 11/A Gheorghe Lazăr Street, 300081 Timișoara, Romania

---

### Abstract

Arsenic removal from groundwater as drinking water source was investigated using electrocoagulation (EC) process with horizontal anodes of iron plate under galvanostatic regime. The current density of  $5 \text{ A}\cdot\text{m}^{-2}$  was determined as the optimum operating conditions at the electrolysis time of maximum 25 minutes and pH ranged between 6.5 to 8.5, by which the arsenic concentration was reduced below  $10 \mu\text{g}\cdot\text{L}^{-1}$ . The aspects related to the arsenic removal mechanism were discussed by Zeta potential. This iron anode-based EC process was successfully applied for the removal of arsenic from a real groundwater characterized by high arsenic concentration of  $255.80 \mu\text{g}\cdot\text{L}^{-1}$  under aeration conditions. After 15 minutes of electrolysis the arsenic removal efficiency of 99.59% was achieved under the optimum operating conditions with the energy consumption of  $0.006 \text{ kWh}\cdot\text{m}^{-3}$  that is 100 times lower than the reported in the literature.

*Key words:* arsenic removal, drinking water treatment, electrocoagulation, iron anodes

*Received:* December, 2016; *Revised final:* February, 2017; *Accepted:* April, 2017

---

---

\*Author to whom all correspondence should be addressed: e-mail: [florica.manea@upt.ro](mailto:florica.manea@upt.ro)