

University POLITEHNICA of Bucharest, Faculty of Applied Chemistry and Material Science  
Department of Inorganic Chemistry, Physical Chemistry and Electrochemistry  
DOCTORAL SCHOOL OF APPLIED CHEMISTRY AND MATERIALS SCIENCE

**Development of real time analytical platforms based on chemical, electrochemical and optical sensors for monitoring, evaluation and control of pollution impact on waters quality from water resources**

*PhD Thesis Abstract*

**PhD Supervisor:**  
Prof. Dr. Eng. Eleonora-Mihaela UNGUREANU

**PhD Student:**  
Chem. Eng. Cristian OMOCEA

New organic compounds (4 differential arsonium salts and 8 azulene derivatives) were electrochemically characterized by cyclic voltammetry, differential pulse voltammetry and rotating disk electrode, new modified electrodes were obtained which were tested for the recognition of heavy metals in water samples, and a set of water quality monitoring data was statistically processed. New optical, spectrophotometric (based on complexation in solution) and electrochemical (based on modified electrodes) sensors were proposed. For electrochemical sensors based on electrodes modified with 2,2'-(ethane-1,2-diylbis((2-(azulen-2-ylamino)-2-oxoethyl)azanediyl)) diacetic acid, remarkable detection limits were obtained. The sensor was also tested on real samples. The evolution over time of key parameters resulting from statistical processing has provided public authorities with useful information on the effectiveness of measures taken to reduce pollution.