



## Editorial

## Nanomaterial-based technologies in electro-sensing of azo toxic dyes in food products: Challenges and perspectives



Azo dyes are a large group of food additives that are widely used in a variety of food products. Some of these dyes, such as Blue 1, Red 40, Yellow 5, and Yellow 6, cause hypersensitivity reactions. Several microbiological investigations showed that Yellow 5 was positive for genotoxicity. On the other hand, studies show that some of azo dyes such as Sudan I can cause cancer. Reports indicate that some of these dangerous dyes are still used in some food products to attract customer attention. Therefore, several attempts have been made in recent years to provide fast and inexpensive sensors for rapid detection or measurement of these compounds and also degradation of them from water samples. Among these, electrochemical sensors are considered by food industry companies more than other methods due to their high analysis speed, cheapness, non-use of toxic solvents and ability to be converted into portable kits. On the other hand, the weak signal of azo dyes has made it challenging to design sensitive sensors to measure their trace level. Nanostructured electrochemical sensors using nanomaterials, especially carbon nanomaterials, have been proposed and their use is increasing to solve this problem. But there are still many challenges to increasing the sensitivity of electrochemical sensors using nanomaterials, which has led to significant growth in research in this area.

This special issue, stressing the above problems, accepted 73 research and review papers on topics such

voltammetric/Amperometric/Potentiometric sensors amplified with nanomaterials for determination of azo toxic dyes, application of soft computing tools to model the best condition in sensing of azo toxic dyes by nanomaterials, DNA and enzymatic biosensors for determination of azo toxic dyes amplified with nanomaterials and application of nanotechnology on degradation and removal of azo toxic dyes.

Papers with good quality included “Amplified electrochemical sensor employing screen-printed electrode modified with Ni-ZIF-67 nanocomposite for high sensitive analysis of Sudan I in present bisphenol A” (Beitollahi et al., 2022); “Recent advances in Ponceau dyes monitoring as food colorant substances by electrochemical sensors and developed procedures for their removal from real samples” (Ghalkhani et al., 2022); “Determination of D&C Red 33 and Patent Blue V Azo dyes using an impressive electrochemical sensor based on carbon paste electrode modified with ZIF-8/g-C<sub>3</sub>N<sub>4</sub>/Co and ionic liquid in mouthwash and toothpaste as real samples” (Karimi-Maleh et al., 2022); (Zhang et al., 2022); and “Recent advantages in electrochemical monitoring for the analysis of amaranth and carminic acid as food color” (Alizadeh et al., 2022) were published in this special issue.

The guest editor team would like thanks from all of the researchers that contributed to the special issue as authors and also the reviewers who help us for qualified submitted papers. In addition, the guest editor team would like thanks from Professor José L. Domingo, Editor-in-Chief at Food and Chemical Toxicology, and Prof. Saura Sahu, RIFM Managing Editor at Food and Chemical Toxicology, for their support and trust to guest editor team, as well as the Journal Manager and the publishing team of Food and Chemical Toxicology that help us in this process.

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Hassan Karimi-Maleh\*

*School of Resources and Environment, University of Electronic Science and Technology of China, P.O. Box 611731, Xiyuan Ave, Chengdu, PR China*  
*Department of Chemical Engineering and Energy, Quchan University of Technology, Quchan, 9477177870, Iran*

Yasin Orooji

*College of Geography and Environmental Sciences, Zhejiang Normal University, Jinhua, 321004, PR China*

Mehmet Lutfi Yola

*Hasan Kalyoncu University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Gaziantep, Turkey*

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Saura Sahu<sup>1,\*\*</sup>  
Center for Food Safety and Applied Nutrition, 6502 South Archer Road, IL  
60501, College Park, MD, USA

\* Corresponding author.

\*\* Corresponding author.  
E-mail address: [hassan@uestc.edu.cn](mailto:hassan@uestc.edu.cn) (H. Karimi-Maleh).  
E-mail address: [saurasahu@gmail.com](mailto:saurasahu@gmail.com) (S. Sahu).  
Handling Editor: Dr. Jose Luis Domingo

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<sup>1</sup> Retired