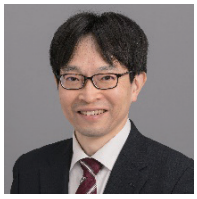
Special Issue on Electrochemical Sensors for Environmental and Biomedical Applications

Preface



Simple and highly sensitive environmental and biomedical analytical methods are required in various fields. Although optical measurements based on absorbance are generally used, they require enzymes, antibodies, and/or chemicals to induce the reaction, and they also have limited sensitivity. On the other hand, electrochemical analysis is highly sensitive and does not require toxic chemicals, making it promising for use in various systems. In addition, it can be used for real-time analysis in both environmental and biomedical analysis. However, in many cases, not only the selectivity but also the durability and stability of the electrode materials are possible problems. Therefore, many ideal electrochemical sensors with electrode materials having high selectivity and stability are currently being developed in attempts to prepare superior analytical systems.

In this special issue, the first paper is a review article describing recent developments and applications of antibody-based, nucleic acid-based, and aptamer-based biosensors for the electrochemical sensing of respiratory viruses. The second paper reports the development of a screen-printed electrode (SPE) modified by boron-doped diamond nanoparticles for Sb^{3+} ion detection in river water. This is followed by a paper on the modification of glassy carbon electrodes by gold nanoparticles for use in a hydrazine sensor. The fourth paper reports the fabrication of a conductive diamond-like carbon (DLC) electrode and a DLC microneedle. This is followed by a report on the design and development of composite electrodes of citrate-modified β-cyclodextrin and Fe_3O_4 for use as a cholesterol sensor. The final paper discusses the development of a modified SPE in a DNA-based electrochemical biosensor.

Most of the papers in this special issue focus on both developing electrode materials and functionalizing the electrode surface to realize selectivity and increase sensitivity, which are the most important points for electrochemical sensors. In the future, the development of electrodes with selectivity and high sensitivity will be increasingly important in a variety of sensing situations in both the environmental and biomedical analytical fields. Therefore, I hope that the examples presented here will give readers an insight into the future.

Finally, I would very much like to acknowledge the staff members of *Sensors and Materials*, as well as all the authors and reviewers. I would particularly like to thank Ms. Tomoko Tanabe (MYU K.K.) for giving me a chance to edit this special issue and for her invaluable help in producing this special issue.

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