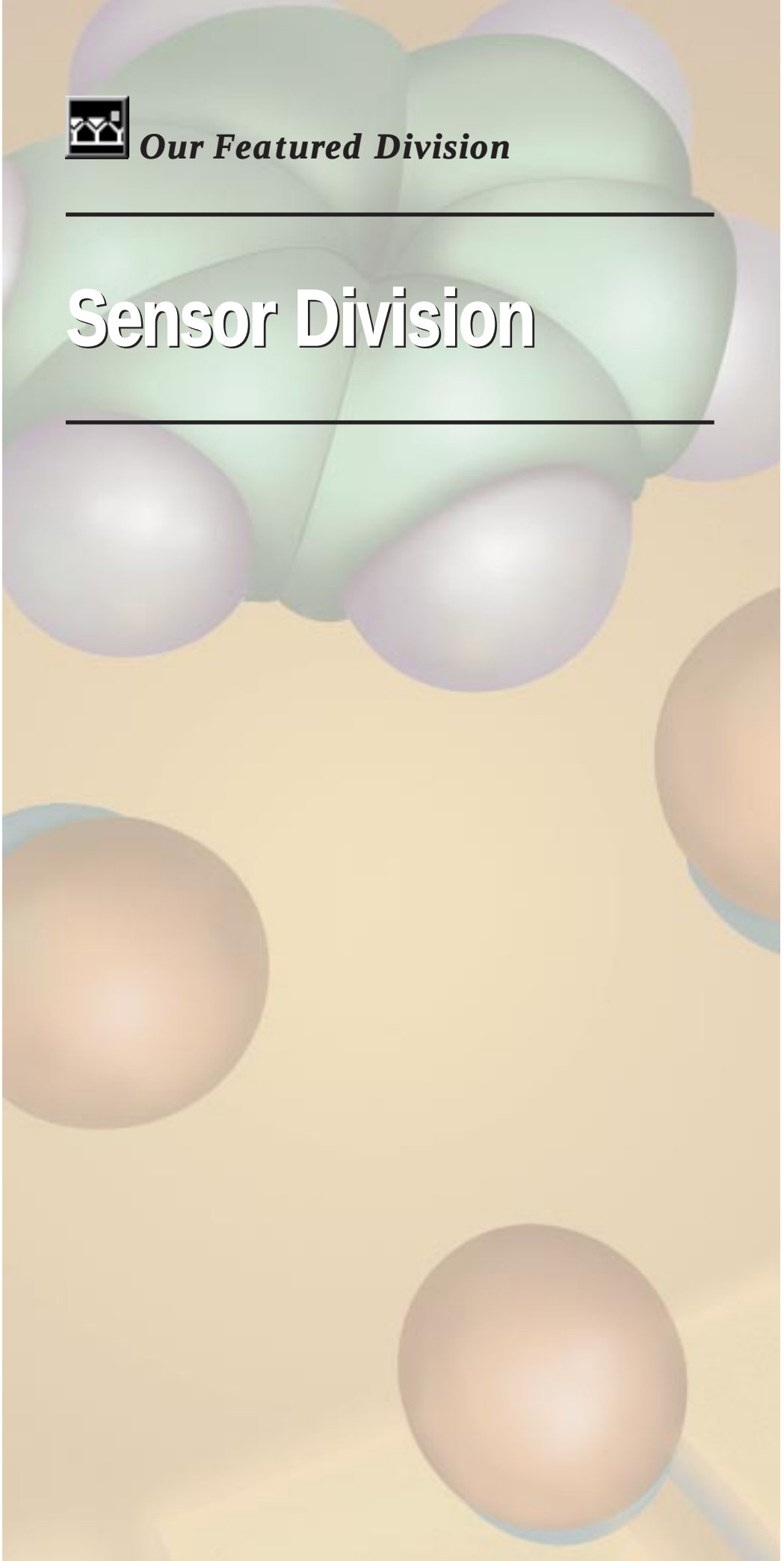

Our Featured Division

Sensor Division

Sensor Division: After a Decade and into the Next Century

by Petr Vanysek

In this issue three articles are featured that provide a profile of the interests of the Sensor Division of The Electrochemical Society. This year is the tenth anniversary of the Sensor Division, which was formed, as a Sensor Group, on May 19, 1988. A brief overview of the first ten years reveals the success of the Division, as marked by its steady increase in membership, the number of organized and co-organized symposia, the number of presented papers, and the number of active participants in each symposia.

An important component of this success resides in the leadership, consisting of very involved and dedicated officers. Three of the past Division chairmen are now Fellows of the Society. The work of the symposia organizers who volunteer their time and resources is equally important. For a symposium to happen, it has to be proposed, keynote speakers identified, and possible attendees invited. We have published a number of proceeding volumes from our symposia; many of them have been available at meetings. Such endeavors create a better and more memorable symposium and also generate some income for the Division. But it also puts an additional burden on the symposium organizers who are responsible for timely collection of all the manuscripts. However, the work for a prosperous Division is rewarding. In the end, the main reason to be involved in any particular Division is to learn about the inventions and the people in the field. This is happening in our Sensor Division at a rapid clip.

This issue of ***Interface*** is aimed toward education about sensors. The first article summarizes the most important issues of sensor science as identified at recent National Science Foundation (NSF) workshops. A few memorable points stand out from this report. One is the realization that sensors have crossed over from device development to a goal-achievement approach. As recently as two years ago, individual researchers would try to implement a particular device to measure as many analytes in as many forms as possible. Today, the methods and platforms are combined in

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order to achieve the most efficient attainment of a particular goal; using a specific device is secondary to the effort. Another advance is visible in the development of sensor arrays where, no doubt, availability of personal computers has enabled the practical progress. Modern desktop machines, with the most complex routines embedded in office software, are also extremely powerful for the processing of pattern recognition algorithms as well as matrix inversion of the linear algebra equations on which chemometrics is based. An array of five to eight sensors can be used for quick detection of a large number of compounds. An interesting but certainly not an immediately obvious fact is that the individual sensors need not, or even should not, be extremely selective to a single species. This means that synthetic chemists, who were trying to design very selective molecules for extractions, will now find discarded compounds with selectivity too low for the initial purpose, but high enough to be used in a sensor array.

Ultimately, marketability of a sensor will justify research in the field. One of the featured articles is written by a scientist working in an industrial setting and describes some of the successes of personal health monitors. This is just one field of widespread commercially viable sensors. One can easily find a number of other sensors that are produced on a large scale: smoke detectors come immediately to mind.

A modern automobile has a number of sensors, although they may not be immediately evident. In fact, a goal of the sensor industry is to provide small, unobtrusive devices, which perform their function well and for a long time. In this issue the article on automotive sensors deals with such devices. It is incredible that a single sensor can detect one misfiring cylinder and presumably, with proper timing, can indicate the particular cylinder. The author of this article is Dr. Lundström, who is this year's recipient of the Sensor Division Award, established in 1989 to recognize outstanding achievement in the science and technology of sensors and to encourage excellence of work in the field.

The Sensor Division and its members are taking active part in the compilation and dissemination of literature about sensors. The previous issue of ***Interface*** dedicated to sensors[1] lists a table classifying sensors. The American Chemical Society (ACS) journal *Analytical Chemistry* has published several reviews dedicated to the sensors[2] and a special issue of *Accounts of Chemical Research* [3] published a number of articles on chemical sensors.

Electronic communication and Internet access to information are signs of the times and much information is available on the Web. One needs to be mindful that much of this information is not peer-reviewed and some is not even peer-authored. Also, not every article that has the word sensor in it deals with a sensor as we recognize it. A useful site for sensor information is http://www.chem.tamu.edu/walker/chemsensors.html.

Of course, one cannot forget the information service provided by the ECS. Electronic submission of abstracts has now become quite routine and mostly a seamless procedure. The resources for planning a future symposium or reviewing the recent history of past meetings are all available within the Society web site. The Sensor Division has taken an active role in placing relevant and current information via the ECS web site at http://www.electrochem.org/divisions/sensor.html. There one can find the minutes of the past committee meetings, the text of yearly newsletters and also a calendar of sensor-related events. This calendar goes back to a time before the Sensor Division or Group even officially existed. With this issue of ***Interface*** we pause for a moment to reflect on the progress in the science and technology of sensors and to celebrate our ten years in ECS. But the pause will be short as sensor R&D moves in leaps and bounds into the next century. ■

References

1. ***Interface***, Vol. 3, No. 4, p. 42, (1994).
2. J. Janata, M. Josowicz, P. Vanysek, and D. M. DeVaney, *Anal. Chem.*, **70,** 179R (1998); J. Janata, M. Josowicz, and D. M. DeVaney, *Anal. Chem.*, **66**, 207R (1994); J. Janata, *Anal. Chem.*, **64**, 196R (1992); J. Janata, *Anal. Chem.*, **62,** 33R (1990); J. Janata and A. Bezegh, *Anal. Chem.*, **60,** 62R (1988).
3. *Accounts of Chemical Research*, **31**(5) (1998).

Sensor Division Future Symposia Plans

Seattle — May 1999

Solid-State Ionic Devices (co-sponsored by the High Temperature Materials and the Battery Divisions); New Directions in Electroanalytical Chemistry, Single Crystal and Nanostructured Electrodes (both by the Physical Electrochemistry and the Organic and Biological Electrochemistry Divisions); Transportation Sensors, and the Sensor General Session.

Hawaii — October 1999

Electroorganic and Electroanalytical Aspects of Environmental Chemistry; Biosensors and Biomolecular Electronics; and Chemical Sensors.

About the Author

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