

Developing Measuring and Analytical Technologies to Deal w

Constant PCB Monitoring at PCB Waste Disposal Facilities

Measures to Deal with the PCB Waste Problem

Polychlorinated biphenyls (PCBs) are stable substances that have a wide range of applications. Everyday products where PCBs are used in large amounts include fluorescent light capacitors and various paints and inks. We now know that the high toxicity of PCBs means they are carcinogenic and have adverse affects on the entire ecosystem.

The former Japanese Ministry of International Trade and Industry ordered a halt to PCB manufacturing and a product recall in 1974, but PCB users had to store the products because no appropriate disposal method had been developed at that time. This situation went on for 30 years resulting in numerous incidents where PCBs leaked from

aging consumer electronics or other products that had not been disposed of properly. In 2001, the Law Concerning Special Measures Against PCB Waste was enacted with the objective of preserving the health of the population and conserving the environment. The law mandated the disposal of PCB waste matter within 15 years, therefore, PCB waste disposal facilities were established across Japan. Appropriate disposal of PCBs is still conducted in these facilities.

Safe PCB Disposal and Peace of Mind

Hitachi High-Technologies' PCB monitoring device, the CP-2000P, is used to monitor PCB generation and is currently in use at various PCB waste disposal facilities in Japan. Such monitoring confirms that the PCBs have been disposed of appropriately and identifies any leaks within or outside the facility, thereby contributing to the safety and peace of mind of residents living near disposal facilities or the workers within the facilities themselves.

The CP-2000P produces highly precise measurements. The system uses atmospheric pressure chemical ionization (APCI) and ion-trap method. The system can be operated continuously for several months due to its' low-maintenance design, which we developed in order to provide trouble-free operations at disposal facilities. This technology supports the safe disposal of PCBs by real-time online measurements of PCB generation.



The CP-2000P PCB monitor is fine-tuned at our plant test facility prior to shipment. Technicians work on individual units to fine-tune the devices.



External appearance of the CP-2000P PCB monitor. The front hose takes in gas from the test facility for measurements.



In 2006, the device was awarded the 33rd Environment Prize jointly sponsored by the Hitachi Environment Foundation and Nikkan Kogyo Shimbun Ltd.

Performance Enhancements and Environmental Conservation

As well as PCBs, there are concerns that dioxins and many other chemical substances have adverse environmental effects and are a threat to ecosystems. We collect sample data, adjust the requirements to suit customers' needs, and work hard to enhance the performance of our devices in order to allow the measurement of highly concerned substances, without need for specialist expertise. In this way, we will continue to deliver safety and peace of mind to all.

With Hazardous Substances

Hitachi Polarized Zeeman Atomic Absorption Spectrophotometer is able to Handle an Increasingly Wide Range of Analytical Targets

Accurate Measurement of Trace Element Concentration

An atomic absorption spectrophotometer (AAS) measures concentration of trace elements in a sample. Hitachi polarized Zeeman AAS is easy to operate and can acquire the accurate value due to the polarized Zeeman method, which requires a strong and stable magnetic field.

The AAS is used in a wide range of analysis in the chemical, manufacturing, pharmaceutical and environmental fields as well as for food testing where content analyses have become important in recent years. The AAS can accurately measure a number of each element, and is used by a wide variety of customers.

Environmental Applications

Environmental concerns are now global in scale and demand for elemental analysis has increased in recent years. Analysis of harmful heavy metals in the soil is necessary not only for agricultural land used to grow crops, but also for residential areas. Tests on river water and drinking water or analysis during the various processes carried out at water filtration plants are vital to ensure safe water supplies for residents and the surrounding ecosystem. Countries are now establishing regulations to govern the amounts of harmful chemical

substances contained in electronic devices and other industrial products to control product safety. The European Union's (EU) RoHS directive is just one of the regulations with which countries and companies must now comply.

Demand for various environmental analyses has driven the use of our Zeeman AAS for accurate measurements of heavy metal elements that may have an adverse effect on our living environments.

When designing the instrument, we looked to improve performance and also build in environmental features such as energy-saving and low-weight designs. For future models, we plan to improve performance further and ensure ease of use while reducing any environmental burden as part of our efforts to conserve the environment.

Hitachi Z-2010 polarized Zeeman AAS can perform accurate measurements using both flame and graphite furnace methods.



VOICE

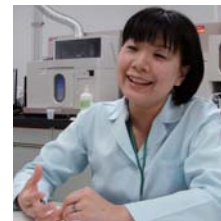
I think that accurate elemental analysis allows more people to lead a safer life. I work to provide easy-to-use devices and analytical technologies that meet our customers' need for accurate measurements. An example would be the measurement of trace amounts of zinc, which is important for environmental analysis, in rivers and seawater. I am glad I can contribute to society by working in this field.



Takayuki Nabeshima
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VOICE

I provide operational training and perform analytical tests on request from customers. Improvements in instrument sensitivity mean we can now directly measure low concentration without the need for a concentration step using organic solvents, which has reduced the amount of solvents used. I want to make customers aware of the environmental aspects of our analytical operations.



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