Editorial

For the Development of Science

Analytical Chemistry started from qualitative chemical analysis and developed to quantitative analysis, and further attained trace analysis by using many sophisticated instruments. Now, determining the structure of trace species and evaluating their chemical functions are highly required. In Nature, no elements or molecules are in ideal solutions, but in most cases exist as assembled or aggregated micro-structures. Therefore, our measurements should not only be limited to the analysis of trace elements and species, but also must be extended to the analysis of molecular assemblies and micro-particles with biological or environmental importance.

The invention of new analytical principles accompanied by excellent instrumentation has brought about many breakthroughs in Science, and has exploited new fields. The scanning probe microscopy pioneered nanoscience and nanotechnology, MALDI-MS initiated proteomics, laser confocal-microscopy innovated cell-biology, capillary electrophoresis reformed classical electrophoresis, surface plasmon resonance lowered the spectroscopic detection limit, the cell sorter drastically increased the sorting rate, quantum dots and nanoparticles extended the concept of analytical reagent, and interfacial spectroscopic methods are helping to the interfacial nanochemistry.

However, these new ideas were not born only from the established knowledge of analytical chemistry, but also from hybridization with exotic knowledge concerning other fields of Science and Technology. Electromagnetism, optics, and fluid mechanics are especially important to invent new devices for micro-separation and micro-analysis. Laser physics and laser optics are also important for single molecule analysis. Nano and micro-fabrication technology is now a key technology for micro-analytical devices. Magnetic force generated by a superconducting magnet will exploit a new field even in Analytical Chemistry. DNA, protein and cells are now most important analytical subjects. Computer simulation is very useful to design the new analytical reagents, and to visualize physical fields generated in nano- and microchips. Non-invasive analysis of bio-particles using a micro-external field will become very important in biotechnology and medical diagnosis. Chemistry and Physics are well hybridized in the analysis of Nature.

After all, Analytical Chemistry needs any possible Science, and Analytical Chemistry leads to the development of Science. The Journal of *Analytical Sciences* invites such innovative work and welcomes any challenges for the invention of new analytical tools and chemicals, to find new meanings in observations and to make new dimensions of Science.

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