Remarks on Special Issue on Materials Characterization Science

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The collapse of the Lehman Brothers in 2008 came as a severe blow to the world economy, which had generally been in a healthy state for some time. On the other hand, there are many problems relating to the environment, population, resources, etc. that call for immediate innovations in order to achieve a sustainable society. Amid these dramatic changes in the global environment, economy, and business, our R&D will have to be more responsive to such changes than ever before.

True, it is difficult to predict or forecast exactly what changes will happen in the future. But it is possible to keep honing our abilities to speedily cope with cyclic and even catastrophic changes on the assumption that they can occur anytime. To this end, we must review basic and underlying technologies and look into the essence of technology, though it may seem to be a roundabout way. Materials characterization science, in particular, is one of the basic, underlying technologies that is now more important than in the past. Relating directly to matter, materials, and phenomena, this technology allows us to closely observe or visualize the forefronts of the workings and functions of materials (commercial value) and the changes in materials (processes) and to clarify the mechanisms of various phenomena (fundamental principles).

Today, our R&D strongly demands "speed" and "overall strength." Some important changes take place so rapidly that we might fail to notice them till their big waves are about to rush upon us. Needless to say, in order for us to follow up these changes and struggle through them, it is extremely important that we carry out R&D with speed, or instantaneous power. In this context, I consider that in our R&D activities, we should always strive to accumulate new technologies. From the standpoint of responding speedily to unpredictable changes, the overall strength of our R&D is also an extremely important factor. In order to take problem-solving measures, it is essential that capable researchers in diverse fields of technology come up with ingenious ideas to solve specific problems and combine their expertise into overall strength for finding solutions. I expect that through the development of new methods of measurement and clarification of basic mechanisms of diverse phenomena, materials characterization science will be able to serve as a technical foundation to make the most of our abilities and overall strength.

It is extremely difficult to foresee or forecast future changes. On the other hand, from the standpoint of creating new values and new markets, it is naturally important for us to take the initiative in bringing about change. In implementing our R&D activities, I think that in addition to perceiving the potential needs of our customers and providing for them, we should not only attach importance to studying the mechanisms that underlie various phenomena and discovering new phenomena and knowledge that may arise in the course of the study, but we should also assume a spirit of standing at the starting point of a value chain created by our R&D. In this context, too, I believe that materials characterization science will play an increasingly important role in many different fields.

I would be delighted if this "Special Issue on Materials Characterization Science" helps to enhance your ability to cope with change, and indeed bring about change for yourselves.