



## Remarks on Special Issue on the Business Segment of Chemicals & Materials

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*In recent years, actions against climate change have become mainstream and demands have risen for an increase in renewable energies, reduction of carbon emissions, growth of electric vehicle usage, and building national resilience. In addition, within only several years, the environment surrounding the manufacturing industry is greatly changing at a level that we have not experienced, e.g. decrease in the labor population, accelerating DX that was stimulated by the rapid development of AI, and the change in social trends caused by the spread of COVID-19. There is newly rising demand in the material segment to find ways to address these environmental changes. A social upheaval period is a risk and at the same time an opportunity for new business. Under these circumstances, research and development divisions are requested to increase the speed of development to deal with environmental changes, exert the overall capabilities throughout segments, and develop seeds by forecasting environmental changes in the future. As the uncertainty increases, it is difficult to predict and estimate changes in the future accurately. However, it is the mission of research and development divisions to create markets and products that can provide new value through seeking and developing seeds that can satisfy potential needs in society, clarifying mechanisms to identify the fundamental principles of phenomena, and recognizing and identifying new matters in the course of research and development.*

*Nippon Steel Corporation and the Nippon Steel Chemical & Material group have conducted cooperative research and development for several decades. The Advanced Technology Research Laboratories of Nippon Steel started, in the 1980s, supporting research, development, and social implementation with the Nippon Steel Chemical & Material group in segments including carbon materials, metallic materials, and functional materials for semiconductors. Based on the utilization technologies of ironmaking by-products, high-level analysis techniques for ferrous materials and development capability of inorganic and organic advanced functional materials that our group possess, Nippon Steel and Nippon Steel Chemical & Material expanded the findings to various application products, which produced great outcomes. Some products won the Ichimura Prize in Industry for Outstanding Achievement, a national invention award etc., in our joint names. This special issue on the business segment of chemicals and materials also includes many research and development reports cowritten by Nippon Steel and Nippon Steel*

*Chemical & Material. This issue can be regarded as an example to demonstrate our overall capabilities. These days, we are in a period of great change. Therefore, we have to continue to offer new value by further deepening and combining production technologies including knowledge on raw materials and products from the viewpoint of materials science, and energy saving and CO<sub>2</sub> emissions reduction technologies; and mathematical and analysis techniques for clarifying the fundamental principles to exhibit the performance of products. I would be grateful if this special issue helps deepen and combine technologies from now on.*