



Preface

Dear colleagues,

Professor Kotaro Honda established a steel research organization officially known as “the 2nd Division of the Provisional Institute of Physical and Chemical Research” at Tohoku University in 1916. In 1987, the organization was restructured into its present form as a national collaborative research institute affiliated to Tohoku University and was consequently renamed “the Institute for Materials Research” (IMR), also known as “KINKEN” (which is the short form for “kinzoku zairyō kenkyūjo,” the Japanese name for IMR).

Since its establishment, IMR has become known for its excellence in both fundamental and applied research on metals and on a wide range of new materials. Numerous functional materials have been studied and developed at IMR, including Kichizaemon Sumitomo (KS) magnetic steel, new KS magnetic steel, SiC fibers, compound alloys, metallic glasses, and others.

IMR has greatly contributed to the advancement of materials science. As one example, our study of magnetism resulted in the invention of the world’s strongest permanent magnet, the KS magnet, which dramatically improves the performance of electrical machines. IMR has historically focused on fundamental research to develop applications for a wide range of advanced technologies. More recently, IMR has developed a wide array of materials including high-performance, high-quality, and multifunctional materials such as amorphous alloys, bulk metallic glasses, intermetallic compounds, quasicrystals, oxides, ceramics, nanostructured Si and Ge, optical and electronic materials, solar cell crystals, biomaterials, organic materials, hydrogen storage alloys, shaped crystals, and III-V, II-VI, and oxide semiconductors.



Director



IMR has completely recovered from the Great East Japan Earthquake that occurred on March 11, 2011, and we are working hard to achieve innovative research and development in the fields of materials science and engineering. KINKEN will celebrate its 100th anniversary on May 21, 2016. We would like to introduce the logo for KINKEN's 100th anniversary, which has been selected from among 726 candidates. We have redefined our missions and are establishing new roles for KINKEN in the post 3/11 era.

We are pleased to introduce KINKEN Research Highlights 2013, the seventh annual report containing a collection of the research output during the previous year at KINKEN. We decided in 2007 to annually prepare this report so that our colleagues around the world can be kept informed about our research activities. The studies conducted at our individual research laboratories and research centers and those jointly conducted with other academic institutions are provided, especially those in the key research fields of infrastructural, energy-related, and electronic materials.

The world faces serious issues such as the deterioration of the environment and the depletion of natural resources and nonrenewable energy sources. IMR will promote research into materials to further address the problems associated with these issues with the aims of sustaining human development and ensuring a high standard of living for all people. In this way, we can offer a brighter future to subsequent generations.

We hope that the KINKEN Research Highlights will enable you to better understand and support our research activities and will aid the promotion of worldwide collaboration with our institute in the field of materials research. We ask for your continued support and welcome any suggestions.