

## SPECIAL ISSUE ON ADVANCES IN SHAPE MEMORY MATERIALS

### PREFACE



Shape memory materials (SMMs) show a shape change in response to an environmental stimulus, such as an applied force and changes in temperature and/or magnetic field. Hence, SMMs are recognized as one of the important engineering materials among intelligent materials. To improve the quality of life, support of human life by advanced machines, such as high-performance medical devices and implantable medical devices, will become more important in the future. SMMs are expected to play an important role in such situations. Particularly when SMMs are used for sensor devices, it is possible to add the function of an actuator because of their large recovery force and/or displacement according to changes in the ambient environment. This contributes to the downsizing and weight reduction of the devices and is an effective method that can simplify the mechanical part of a machine.

In the future, together with existing technologies, it is expected that SMMs will be used in devices that are compatible with the super-aging society and contribute to reducing the environmental load. On the other hand, for these materials to be newly adopted, it is necessary to meet the ever-increasing demand for high functionality, and it is also essential to improve the performance of these materials with excellent mechanical and shape memory properties that meet the demands of applications.

This special issue was planned by the Research Committee on High Functionality and Application of Shape Memory Materials (P-SCD406) of the Japan Society of Mechanical Engineers (JSME) and consists of five articles covering all aspects from theory and modeling to applications. We hope that these articles will be useful for not only related researchers, but also engineers, including designers of sensors and actuator devices.

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Ryosuke Matsui  
Aichi Institute of Technology  
Japan

Hiroyuki Miki  
Tohoku University  
Japan