

Recent Developments in Research on Porous Metals and Foamed Metals

Preface

Porous metallic materials consist of many pores which are usually considered as defects. However, such pores can be utilized for some functional entities. Porous metallic materials such as foamed metals, lotus-type porous metals, cellular metals and hollow sphere structure are increasingly anticipated as prospective light-weight structural materials and functional materials with e.g., superior sound absorption, damping and filtering properties. The porous metals are a new category of promising engineering materials from the viewpoint of both fundamental science and industrial applications.

To realize such applications various problems in the fabrication such as uniformity in pore size and porosity controlled with variable factors should be solved and, furthermore, their properties should be sufficiently understood and elucidated. Investigations on the science and technology of porous and cellular metallic materials have been undoubtedly expanding these days. The present special issue summarizes the present status of porous and cellular metallic materials science.

It is well understood that porous and foamed metals could be useful to solve the main issues of the twenty-first century such as environmental preservation, aging society and energy problems. For example, foamed aluminum is anticipated as a crush absorber of

automobiles and sound absorption materials, while porous metals with elongated directional pores may be useful for medical devices and machinery materials. There are a variety of fabrication methods, which are classified into powder sintering, foaming and casting techniques. Furthermore, porous metals are grouped into porous and cellular metals depending upon the magnitude of the porosity; the metals with porosity less than 30% are termed porous, while those with porosity more than 30 % are termed cellular metals. In this issue, lotus metals belong to the former and the foamed metals are among the latter.

The present issue consists of ten articles to introduce recent developments in the fabrication of foamed and porous metals.

I hope this special issue stimulates the readers to become interested in porous and cellular metallic materials science and technology and give a trigger to prospective development of this remarkable field.

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