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Urban Mining Systems

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Preface

Mass production systems for large-scale consumption will change due to global warming (climate change), diffusion of harmful wastes, and depletion of resources (especially energy resources). Nevertheless, the present period can be called the most active in terms of material production and consumption in the history of humans, although there are great differences in these activities depending on the part of the world. The essence of the environmental problem now being faced is a result of (1) the growth and diversification of production activity to maintain a comfortable human lifestyle and (2) the discharge of too much untreated waste. However, it is difficult to evaluate the ability of the earth to “clean itself up” scientifically, and it is also difficult to rapidly change our present lifestyle.

Establishment of a sound “circulatory society” involves not only recycling materials, but includes the 3Rs (reuse, reduce, recycle) as well as the prevention of the dispersal of harmful substances, and perhaps the primary issue is prevention of global warming. The concept of a circulatory society includes no decrease in conventional production volumes (yield), but more energy conservation than ever before, effective use of natural resources, and no output of waste. Currently, we are at the stage where reviews are being conducted on what kind of circulatory society should be created and what the stance of industry should be in order to achieve it. In Japan, under the Basic Environment Law to Promote Formation of a Circulatory Society, specific recycling acts were established, and the so-called 3Rs were promoted as part of national policy.

The 3Rs and waste treatments are a growing area in metal production industries. There is no doubt they take up the major part of the field. Also, more collaboration between different research fields is necessary in order to make progress. This is indeed a paradigm shift. With this background, “urban mining” becomes an important concept to achieve a sound circulatory society. In the past, man has created arts and crafts that contain various metals. Deposits of some metals in end-of-life products will eventually become larger than those of natural resources, and then recovery of those metals from urban “mines” will be economically feasible. We believe this short book can generate enthusiasm in this field throughout the world.