

Preface

It is well known that many physical and physico-chemical properties of various materials are directly related to their certain structural features at a mesoscopic scale of about 10^{-7} m as well as a microscopic scale of the order of nm (10^{-9} m). The structure of materials of interest is always different from its idealized one and its divergences are found to vary greatly. For this reason, the utmost importance of structural characterization of materials has been well recognized as one of the most essential research subjects from both basic and applied science point of view.

The development of various new advanced materials such as a magnetic multilayer of superlattice, amorphous alloys and semiconductors and inter-metallics stimulates current interest in this rapidly growing field and this has also led to an increasing need for understanding the structure-properties relationships by obtaining the particular features in their atomic arrangements. For this purpose, the near neighbor atomic correlations of the individual chemical constituents or the local chemical environments around a specific

element is strongly required for describing the quantitative atomic scale structure in multicomponent systems of interest.

On the other hand, various reactions through the surface of materials or the liquid/vapor and liquid/solid interfaces are known to play a significant role in many processes for advanced materials. Thus, the information of the structures of surface and interface is strongly required. However, the structural studies of interface of liquids and surface layer of solids are still limited and then their knowledge at the atomic level is far from complete.

With these facts in mind, we have tried to make this special issue interesting to scientists in many different fields who wish to keep up to date with fast-breaking trends and applications of materials characterization. This volume contains ten articles, which were provided by the specialists of the respective modern techniques for materials characterization.

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