

Preface

The 2012 2nd International Conference on Materials Engineering for Advanced Technologies (ICMEAT 2012) will be held on December 27-28, 2012, Xiamen, China.

Materials science is an interdisciplinary field applying the properties of matter to various areas of science and engineering. This scientific field investigates the relationship between the structure of materials at atomic or molecular scales and their macroscopic properties. It incorporates elements of applied physics and chemistry. With significant media attention focused on nanoscience and nanotechnology in recent years, materials science has been propelled to the forefront at many universities. It is also an important part of forensic engineering and failure analysis. Materials science also deals with fundamental properties and characteristics of materials.

The material of choice of a given era is often a defining point. Phrases such as Stone Age, Bronze Age, and Steel Age are good examples. Originally deriving from the manufacture of ceramics and its putative derivative metallurgy, materials science is one of the oldest forms of engineering and applied science. Modern materials science evolved directly from metallurgy, which itself evolved from mining and (likely) ceramics and the use of fire. A major breakthrough in the understanding of materials occurred in the late 19th century, when the American scientist Josiah Willard Gibbs demonstrated that the thermodynamic properties related to atomic structure in various phases are related to the physical properties of a material. Important elements of modern materials science are a product of the space race: the understanding and engineering of the metallic alloys, and silica and carbon materials, used in the construction of space vehicles enabling the exploration of space. Materials science has driven, and been driven by, the development of revolutionary technologies such as plastics, semiconductors, and biomaterials.

Before the 1960s (and in some cases decades after), many materials science departments were named metallurgy departments, from a 19th and early 20th century emphasis on metals. The field has since broadened to include every class of materials, including ceramics, polymers, semiconductors, magnetic materials, medical implant materials and biological materials (materiomics).

ICMEAT 2012 will be the most comprehensive conference focused on the various aspects of advances in Materials Engineering for Advanced Technologies. Our conference provides a chance for academic and industry professionals to discuss recent progress in the area of Materials Engineering for Advanced Technologies.

The success of this truly international symposium has attributed to the efforts of the organizing committee. We also want to thank all the invited speakers, oral and poster presenters, reviewers of manuscripts, participants of the symposium who have contributed to the success of this international symposium.

Ming Wu

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