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Nanotechnologies — Considerations for the development of chemical nomenclature for selected nano-objects

Nanotechnologies — Considérations concernant le développement de la nomenclature chimique de nano-objets choisis

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Contents

Page

Foreword

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The committee responsible for this document is ISO/TC 229, *Nanotechnologies*.

Introduction

For the purposes of this Technical Report, the term *nomenclature* refers to the name and a minimum set of descriptors which are uniquely assigned to a particular nano-object entity or complex. Advanced measurement and instrumentation allows us to "see" at the nanoscale. Measurement tools and techniques are improving our ability to distinguish among nano-objects with the same chemical composition, but which behave differently, based on differences in size, shape or surface functionalization. Yet, the application of established chemical nomenclature systems to describe differences among nano-objects with the same chemical composition has limitations.

For the research and development community, including academia, nomenclature assists in the communication of properties, effects and other relationships or interactions between nano-objects. It also enables effective communication regarding the specific nano-object, which facilitates repeatability of experimental data by other scientists, replication by manufacturers, and application for and protection of patents. For industry and consumer groups, specific names to distinguish nano-objects allow differentiation between products, facilitate patent applications and protect intellectual property rights. Regulators rely on chemical nomenclature to characterize chemical substance and manage the associated environmental and health risks, if and where applicable.

This Technical Report presents an initial effort to support new work Item proposals to pursue chemical nomenclature that is specifically tailored to nano-objects. It identifies categories of nano-objects which could require distinct nomenclature models and discusses essential descriptors to support nano-object nomenclature conventions. A future consideration will be to decide whether to undertake the development of a searchable information system capable of cataloguing a sizable library of names and structural features. This Report also makes recommendations concerning collaboration with existing chemical nomenclature organisations. Finally, this Technical Report considers how the development of nomenclature models for nano-objects will keep pace with and incorporate new science and terminology.

It should be understood that the term "nanomaterials" is broadly defined by ISO to encompass "nano-objects" and "nanostructured materials". In the future, consideration will be given to chemical and nonchemical nomenclature for classes of nanostructured materials, devices and systems at the nanoscale, and strategic application areas.