

TECHNICAL REPORT

ISO/TR 12802

First edition
2010-11-15

Nanotechnologies — Model taxonomic framework for use in developing vocabularies — Core concepts

*Nanotechnologies — Modèle de cadre taxinomique pour utilisation dans
le développement de vocabulaires — Concepts de base*



Reference number
ISO/TR 12802:2010(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope	1
2 Purpose of the framework development.....	1
3 Methodology	1
4 Framework development	2
4.1 Fields of activity at the nanoscale	2
4.2 Nanomaterial.....	3
4.3 Processes.....	5
4.4 Nanosystems and nanodevices	7
4.5 Properties	8
Annex A (informative) Development steps for the core concept framework diagrams	18
Annex B (informative) Alternate version of the “synthesis” branch of the processes framework diagram.....	20
Bibliography.....	21

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 12802 was prepared jointly by Technical Committee ISO/TC 229, *Nanotechnologies*, and Technical Committee IEC/TC 113, *Nanotechnology standardization for electrical and electronic products and systems*. The draft was circulated for voting to the national bodies of both ISO and IEC.

Other vocabulary documents developed by ISO/TC 229 and IEC/TC 113 include the ISO/IEC 80004 series, which consists of the following parts, under the general title *Nanotechnologies — Vocabulary*:

- ISO/TS 80004-1, *Nanotechnologies — Vocabulary — Part 1: Core terms*
- ISO/TS 80004-3, *Nanotechnologies — Vocabulary — Part 3: Carbon nano-objects*

The following parts are under preparation:

- ISO/TS 80004-4, *Nanotechnologies — Vocabulary — Part 4: Nanostructured materials*
- ISO/TS 80004-5, *Nanotechnologies — Vocabulary — Part 5: Bio/nano interface*
- ISO/TS 80004-6, *Nanotechnologies — Vocabulary — Part 6: Nanoscale measurement and instrumentation*
- ISO/TS 80004-7, *Nanotechnologies — Vocabulary — Part 7: Medical, health and personal care applications*
- ISO/TS 80004-8, *Nanotechnologies — Vocabulary — Part 8: Nanomanufacturing processes*

ISO/TS 27687:2008, *Nanotechnologies — Terminology and definitions for nano-objects — Nanoparticle, nanofibre and nanoplate* will be revised as ISO/TS 80004-2, *Nanotechnologies — Vocabulary — Part 2: Nano-objects: Nanoparticle, nanofibre and nanoplate*.

Introduction

This Technical Report provides a possible model taxonomic framework of core concepts for nanotechnology. The framework identifies the basic categories of nanotechnology, as well as the core concepts within these categories, and displays them in a hierarchical structure. From the core concepts, a list of core terms to be defined has been identified. Definitions for these terms will be developed in ISO/TS 80004-1, *Nanotechnologies — Vocabulary — Part 1: Core terms*. Definitions for terms in subject-related areas will be developed in other ISO/IEC Technical Specifications in the ISO/TS 80004 vocabulary series. See list in the Foreword

Communication is crucial to scientific practitioners, industry and trade, and regulatory bodies. Due to different backgrounds and needs, there can be widely divergent understandings and assumptions about concepts. The result is poor communication, a lack of interoperability among systems, and duplication of effort as different groups strive to define concepts in accordance with their perspectives.

A taxonomic framework of core terms is intended to place nanotechnology concepts into context by indicating relationships among these concepts. Such context can provide users with a structured view of nanotechnology and facilitates common understanding of nanotechnology concepts. Jointly, the model framework together with the core term definitions will be beneficial to industry, consumers, governments, and regulatory bodies because they promote clear, accurate and useful communication. Because the taxonomic framework looks at nanotechnology from a number of different viewpoints, it will minimize duplication of effort among stakeholders and assist in developing a harmonized vocabulary of terms.

This Technical Report attempts to remain current with the present usage of terms in this Technical Report and with the ongoing work by ISO/TC 229 and IEC/TC 113 to define such terms. However, definitions within the field of nanotechnologies are still evolving. Updating of this framework model for core concepts in concurrence with development of ISO/IEC vocabulary for nanotechnologies is recommended.

Nanotechnologies — Model taxonomic framework for use in developing vocabularies — Core concepts

1 Scope

This Technical Report establishes core concepts for nanotechnology in a model taxonomic framework. It is intended to facilitate communication and promote common understanding.