

OECD'S WORK ON CHEMICALS SAFETY

For the last 40 years, the OECD has been dedicated to promoting chemical safety worldwide. The aims of its work on *Environment, Health and Safety (EHS)* are to protect human health and the environment, while avoiding duplication of efforts; and ensuring efficiency and reduction of trade barriers.

Common policies and high-quality instruments for chemical safety

The OECD develops *OECD Guidelines for the Testing of Chemicals (TG)*. Together with the *OECD Principles of Good Laboratory Practice (GLP)*, these harmonised, common tools are used by countries to test and assess the potential risks of chemicals, and are set to be accepted by all the member countries through the Council Decision on the **Mutual Acceptance of Data (MAD)**. MAD is a foundation for harmonisation of chemicals management policies and their implementation. It ensures high-quality test data and a common basis of information for assessing risks to human health and the environment, thereby facilitating government evaluations and work sharing.

The OECD's system of mutual acceptance of chemical safety data (MAD) is seen as a crucial step towards international harmonisation and reduction of trade barriers among countries. MAD is open to non OECD economies.

ABOUT OECD

The *Organisation for Economic Co-operation and Development (OECD)* is an intergovernmental organisation, whose aim is to promote policies for sustainable economic growth and employment. By "sustainable economic growth" the OECD means growth that balances economic, social and environmental considerations.

OECD offers a forum where government representatives meet for discussions on key issues, supported by policy analysis. This helps to build common understanding amongst countries on key technical issues, and to bring clarity to new and emerging issues.

OECD's WPMN is regularly engaging not just member countries – the major developed countries – but also key emerging economies, such as China, the Russian Federation, South Africa, and Thailand. In addition, the discussion benefits from the inputs from other stakeholders such as Environmental NGOs, Labour, Industry and Animal welfare groups.

Publications and additional information on the OECD programme

All publications are available for free at:

www.oecd.org/env/nanosafety

Contact: nanosafety@oecd.org

SAFETY OF MANUFACTURED NANOMATERIALS

A nanometer (nm) is one thousand millionth of a meter. In a nano-scale, typically within the range of 1 -100 nm in at least one dimension, the properties of materials can be very different from those on a larger scale. The novel properties of nanomaterials enable diverse application areas, such as in medicine, environment and energy production.

Manufactured nanomaterials are chemicals at the nano-scale (1 - 100 nm in at least one dimension), that can be:

- ✓ materials with new properties developed from old materials (e.g. carbon black)
- ✓ new materials (e.g. fullerenes)
- ✓ existing materials (e.g. TiO₂)

These possibilities lead to a lot of benefits including:

- more targeted drug delivery for therapy using dendrimers
- effective waste-water treatment with carbon nanotube filters
- enhanced renewable energy sources from solar cells using silicon nanocrystals

Manufactured nanomaterials are already used in a number of commercial applications. At the same time, there have been discussions regarding potential unintended hazards to humans and the environment.

As a response, the OECD launched a **strategic programme on the safety evaluation and risk assessment of manufactured nanomaterials to assist countries in the implementation of national policies** that ensure the responsible development of these technologies.

OECD'S PROGRAMME ON THE SAFETY OF MANUFACTURED NANOMATERIALS

The OECD's *Working Party on Manufactured Nanomaterials* (WPMN) was established in 2006 to promote international co-operation in human health and environmental safety aspects of manufactured nanomaterials. Its aim is to assist countries in their efforts to assess the safety implications of nanomaterials.

Priority Areas for the WPMN

The OECD programme has focused in generating appropriate methods and strategies to ensure potential safety issues, through:

- ✓ Establishing an OECD database on manufactured nanomaterials to inform and analyse research activities and strategies on environmental, human health and safety issues;
- ✓ Testing specific nanomaterials for their human health and safety evaluation, while ensuring appropriate testing methods (*in vivo* & *in vitro*);
- ✓ Promoting co-operation on voluntary schemes and regulatory programmes;
- ✓ Facilitating international co-operation on risk assessment strategies;
- ✓ Developing guidance on exposure measurement and exposure mitigation (workplace; consumers; and the environment); and
- ✓ Promoting the environmentally sustainable use of nanotechnology through enhancing the knowledge base about life cycle aspects of manufactured nanomaterials. This should be done at their different stages of development and applications regarding the impacts on human health and environmental safety.

SAFETY ASSESSMENT OF MANUFACTURED NANOMATERIALS

OECD is reviewing whether or not existing test methods used for 'traditional' chemicals are adequate to assess the safety of these new substances.

In addition, the work seeks to understand the intrinsic properties of nanomaterials that will provide crucial information of exposure and their potential effects on humans and the environment.

Through the OECD's *Sponsorship Programme for the Testing of Manufactured Nanomaterial*, OECD members, together with non OECD economies and industries, agreed to pool resources and expertise to test a selected list of manufactured nanomaterials for approximately 59 endpoints (effects measurements and observations) relevant to environmental safety and human health.

Each type of nanomaterial is being tested for:

- Nanomaterials Information/ Identification
- Physical-Chemical Properties
- Environmental Fate
- Environmental Toxicology
- Mammalian Toxicology
- Material Safety

The nanomaterials currently being evaluated are those with commercial relevance including:

Fullerenes (C₆₀), SWCNTs, MWCNTs, Silver nanoparticles, Iron nanoparticles, TiO₂, AlO, CeO, ZnO, SiO₂, Dendrimers, Nanoclays and Gold nanoparticles

OECD'S DATABASE ON RESEARCH INTO THE SAFETY OF MANUFACTURED NANOMATERIALS

OECD's database is a global resource for research projects that address environmental, human health and safety issues of manufactured nanomaterials. The database helps to collect research information, to search details by categories (e.g. nanomaterials, test methods, research areas, etc) and to identify research gaps. On the other hand, it should assist researchers in future collaborative efforts. This also provides key information for the implementation of the other projects of the *OECD's Working Party on Manufactured Nanomaterials* (WPMN).

<http://webnet.oecd.org/NanoMaterials>

INTERNATIONAL COLLABORATION

OECD is a Participating Organisation of the *Inter-Organisation Programme for the Sound Management of Chemicals* (IOMC). The purpose of the IOMC is to strengthen co-operation and increase co-ordination in the field of chemical safety amongst international organisations.

OECD is also engaged bilaterally with other intergovernmental organisations addressing the safety of manufactured nanomaterials, such as FAO, UNITAR and WHO.

There is still much to learn to fully understand how to work safely with some nanomaterials. However, if countries continue to work together in the OECD, as they have started to do, this should ensure that the human health and environmental safety aspects are addressed appropriately and efficiently at the same time, as the economic opportunities of the technology advance.