ECHA
EUROPEAN CHEMICALS AGENCY

Tour de table

18th meeting of the ECHA Nanomaterials Expert Group (ECHA-NMEG-18)
20-21 November 2023, Helsinki, Finland

The representatives from the Member States, the Commission, the accredited stakeholder organisations from industry and NGOs, and ECHA are encouraged to summarize **briefly** below any **highlights/progresses** since the previous meeting in areas relevant for the work of the NMEG. The aim is to share information within the NMEG, and possibly identify **topics for future discussions**. NB: only non-confidential information should be shared.

1. Registration & IUCLID reporting

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By 31 October 2023, **858** registration dossiers covering nanomaterials were successfully submitted, resulting in a total of **169** substances covering nanoforms for which registration dossiers have been submitted following the updated REACH requirements.

2. Substance identity and characterisation of nanoforms (Annex VI)

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The remaining MWCNT (opt-out) Annex VI compliance check case has been referred to MSC-84 (December 2023).
ECHA has been in contact with registrants to support on reporting the nanoforms with regards to Annex VI data requirements. The main concern was related to reporting a single nanoform instead of a set of nanoforms. Support was provided through ECHA helpdesk on questions related to the characterization of nanoforms (e.g., definition of constituent particles, details of surface treatment).

3. Phys-chem characterisation of nanomaterials (Annex VII)

ASO-ECOPA

This is the basis for any further assessment. We need to think about new definitions of parameters such as water solubility and Kow that have a direct impact on the bioavailability of nanomaterials.

4. Hazard evaluation – human health

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We need to acknowledge that traditional animal tests are not applicable to nanomaterials for mainly two reasons:
- Toxicological Properties of nanomaterials can only be defined through the investigation of the mechanism (typical of the NAM approach) rather than the recording of the adverse effects following administration to animal of high doses
- Each form of nanomaterials has its own characteristics and needs to be tested. We need a high number of new tests, which is impossible by mean of long and expensive animal studies.

5. Hazard evaluation – environment

MSCA-RO

Impact of nanoparticles on micro-biota in the Danube Delta and Black Sea coast

UK Centre for Ecology and Hydrology

Developing a framework to assess the hazard of nanomaterials to the environment and aid safety-by-design decision making for manufactured nanomaterials.

6. Read-across and grouping for nanomaterials

ECHA

The work on the nanomaterial-specific chapter 6.9 for the update of the OECD Guidance on Grouping of Chemicals, Series on Testing & Assessment No. 194, ENV/JM/MONO(2014)4 is ongoing. The integration of the current version of the draft chapter is going to be discussed with the OECD Grouping Guidance drafting group for harmonisation and finalisation.

ASO-ECOPA

The possibility of defining grouping and read across is necessary, due to the high number of different forms. The risk to consider similar two different nanoforms that have different risk characterisation is very high. This step can be performed only through NAM testing and this aspect should be further investigated.

7. Exposure assessment (e.g. exposure measurement, exposure mitigation)

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8. Risk assessment

MSCA-NL

RIVM is part of the NAMS4Nano project that is procured by EFSA. The project aims to **gain experience with New Approach Methodologies (NAMs) for nanomaterials**, amongst others to bridge information to non-nano counterparts. For various materials Integrated Approaches to Testing and Assessment (IATAs) are being developed to assess relevant questions in risk assessment, whereas for other materials more general considerations are investigated. RIVM is (co-)chair for nanosilver, nanofibres and simple organism models. The project spans 4 years and started in April 2023.
The Netherlands Competent Authority has submitted a Justification Document for the placement of the substance **graphene oxide** (EC nr. 947-768-1) on the Community Rolling Action Plan (CoRAP). The **Substance Evaluation** is anticipated to start in March 2025. This submission is based on concerns on the potential effects upon long-term inhalation in combination with wide dispersive use. Currently, no repeated dose toxicity studies with graphene oxide are available and potential long-term effects of graphene oxide cannot be assessed. In addition, also immunotoxicity and genotoxicity need further assessment based on the effects observed in current acute / sub-acute data.

MSCA-RO

Risk assessment of antistatic coatings for solar panels. Some of the antistatic coatings have nanoparticles in composition.

9. Guidance or good practice documents for registrants and stakeholders

COM-JRC

The JRC has published guidance for the Commission Recommendation 2022/C 229/01, see reference:
Guidance on the implementation of the Commission Recommendation 2022/C 229/01 on the definition of nanomaterial. H. Rauscher, V. Kestens, K. Rasmussen, T. Linsinger, E. Stefaniak, EUR 31452 EN, Publications Office of the European Union, Luxembourg, 2023, ISBN 978-92-68-01244-4, doi:10.2760/143118, JRC132102

Additionally, The NanoDefiner Framework and e-Tool has be revisited in light of the new Commission Recommendation 2022/C 229/01, see reference:
NanoDefiner Framework and e-Tool Revisited According to the European Commission's Nanomaterial Definition 2022/C 229/01. Brüngel, R.; Rückert, J.; Müller, P.; Babick, F.; Friedrich, C.M.; Ghanem, A.; Hodoroaba, V.-D.; Mech, A.; Weigel, S; Wohlleben, W.; Rauscher, H. Nanomaterials 2023, 13, 990. https://doi.org/10.3390/nano13060990
As a point of general interest the JRC developed an EU Academy course 'Nanomaterials in EU legislation', which is freely available at: https://academy.europa.eu/courses/nanomaterials-in-eu-legislation

MSCA-NL

As one of the outcomes of the Gov4Nano project (EU Horizon 2020 Grant agreement 814401) a roadmap was published (doi: 10.1016/j.impact.2023.100483) that aims to **strengthen standardisation activities**. Based on state of the art standardised and harmonised methods for nanotechnology developed by the International Organization for Standardization (ISO), the European Committee for Standardization (CEN), and the Organisation for Economic Co-operation and Development (OECD) improvements needs for new themes in standardisation work were identified. Themes addressed include physical chemical characterisation, assessment of hazard, exposure, risk and socio-economic factors, as well as education & training and social dialogue. The overall objective of these actions is to strengthen risk governance towards a safe use of nanomaterials and nano-related products.

Work has been initiated in ISO/TC194 to prepare a revision of ISO/TR 10993-22 **Biological Evaluation of Medical Devices – Guidance on Nanomaterials** (2017) and transfer the document from a Technical Report to a Technical Specification under a co-lead by NL and Norway. At a meeting in October 2023, directions for the revision of the document were discussed and subgroups were proposed to work on different sections of the document. The first subgroup will review developments on definitions and requirements in ISO standards, OECD and other regulatory guidance documents. A call for additional experts is planned to be issued.

The European project NanoHarmony finished in September 2023 and provided several **NanoHarmony legacy** items. As contribution to the Malta Initiative NanoHarmony has provided a **scientific background for a range of different OECD documents** on different nanomaterials related topics, including surface chemistry, solubility and dissolution rate in water and biological media, dustiness, quantification of nanomaterials in biological samples, toxicokinetics, intestinal fate, bioaccumulation and ecotoxicology. Furthermore, it provided **support for**

developers of OECD Test Guidelines with an online process mentor (www.testguideline-development.org), which also provides training materials to facilitate education on OECD, its documents and its processes. Last but not least NanoHarmony has provided a **White Paper** with recommendations to (further) optimise the Test Guideline development process, and to ensure a continuous effort in keeping test guidelines up-to-date with advances in material innovations, test method/technology developments, and new regulations and policy strategies. A first draft version of the White Paper was presented and discussed in the NanoHarmony Policy Meeting in Brussels on 23th May 2023. The White Paper supports and strengthens the Position Paper of the Malta Initiative that advocates a European Test Methods Strategy that ensures continuous financial support for the systematic (further) development of OECD Test Guidelines.

A qualitative **SSbD self-assessment methodology** was developed for industry and SMEs within the **SUNSHINE project**. This approach enables safety and sustainability assessment at each stage of product development from a lifecycle perspective. The Tier 1 (self-assessment) methodology evaluates the safety, functionality and sustainability in the early R&D stages of the lifecycle of chemicals and materials. The approach was tested using two real industrial case studies. One case study focused on a nano-enabled anti-sticking coating for bakery molds that is free of PFAS (Polyfluoroalkyl substances). The other case study looked at nano-drops of essential oil anchored to the surface of nano clays and encapsulated in a polymeric film. The results indicate that these innovative materials have a high probability to have better safety, functionality and sustainability performance compared to conventional benchmark materials.
Within the SUNSHINE-project, an analysis was performed of how different EU regulations such as REACH cover multi-component nanomaterials. This work will be presented in the NMEG-18 'Regulatory preparedness of EU Regulations for the more complex multi-component nanomaterials (MCNMs) – Learning from EU project Sunshine'. The main goal of this work is to develop a regulatory preparedness system where potential gaps in regulation can be identified and discussed with regulators

10. Relevant new research projects or strategies on nanomaterials

ECHA

With the entry of the nanoform requirements, in particular the information requirements set in Annex VI, section 2 of REACH, several knowledge gaps were raised. Among them it became evident that, in the absence of a '80:20 rule' applicable to nanoforms, it would be clear neither for registrants nor for regulator how to distinguish single nanoparticles or how to meaningfully group them. To try overcoming this issue, ECHA has launched a project called Nanomaterial Risk Assessment: a regulatory way forward for sameness and grouping approaches (ECHA/2023/14). The project calls for a proposal on criteria to distinguish single nanoforms, i.e., sameness, and sets of similar nanoforms, i.e. similarity. The proposed criteria should define clear threshold values for each of the required characterisers and, ideally, identify additional properties relevant for nanoform grouping. The project was launched in June 2023 and a draft proposal should be delivered within a year. Refinement of the proposed criteria will be pursued in the second year, providing the results are adequate, based on project extension.

MSCA-DE

Investigation of ecotoxicological effects of fibrous and platelet-shaped advanced materials for deriving adapted testing strategies

Fibrous and platelet-shaped advanced materials, such as carbon nanotubes, graphenes or MXenes, exhibit exceptional mechanical, electronic, optical and chemical properties. They are therefore being investigated for a variety of applications. These include, for example, optoelectronic applications (e.g. solar cells, light-emitting diodes), sensor technology, composite materials (e.g. for electrical conductivity, EMC shielding), energy storage, catalysts or textiles (e.g. for electrical conductivity, flame retardancy). Fibrous and platelet-like advanced materials may pose methodological challenges for regulatory risk assessment under EU chemical legislation due to their properties. The mechanisms contributing to the ecotoxic effects of these materials are poorly understood. In addition, there is concern that potential ecotoxic effects of the materials are not adequately elucidated via classical methods. Thus, there is a need to develop appropriate testing strategies to identify relevant mechanisms and (sub)lethal effects that allow a specific assessment of the ecotoxic potential of fibrous and platelet advanced materials. In this project, specific mechanisms of action and relevant (sub)lethal effects of these materials will be investigated based on a literature review. Based on that it will be derived which test systems must be used in order to be able to make specific statements on the ecotoxicology of these materials. Selected test systems will be tested and adapted using selected fibrous and platelet materials as examples. In this way, recommendations will be derived as to how non-classical effects could be taken into account in the environmental risk assessment of such materials and what further steps would have to be taken.
Duration: September 2023 to August 2026; Contractor: Helmholtz Centre for Environmental Research (UFZ) together with Institute for Energy and Environmental Technology (IUTA e.V.) and Fraunhofer Institute for Molecular Biology and Applied Ecology (IME)

ASO-NIA

-The Nanotechnology Industries Association is co-author of the NanoHarmony EU project white paper, which provides recommendations on how to streamline the processes of OECD TG development to ensure engagement of all the relevant stakeholders, to make the process of TG development more effective.

-The Nanotechnology Industries Association, as part of the EU NanoHarmony project activities, is involved in the development and launching of the Process Mentor Platform, which represents a tool which provides guidance and understanding on developing OECD Test Guidelines (TGs) and Guidance Documents (GDs), including when and how to prepare for required activities, highlighting key start and finish dates of the development process, plus who to involve in which activities and when.

MSCA-NL

The **European project** **MACRAMÉ** concentrates on methodologies that are applicable to nanomaterials and widens them to advanced materials in commercialised products. Within the project, five advanced materials (products) are selected for sampling and characterisation during their life cycle; three based on graphene, one based on carbon nanotubes and one on nanomedicine. Furthermore, potential impacts on (human) health and the environment in intended or unintended exposure situations in the product value-chain will be assessed. The developed and improved methods and techniques will be further advanced for OECD test guidelines and standardisation (CEN/ISO). Within the project, RIVM will use air liquid interface (ALI) models developed and used within previous EU projects to assess potential hazard of the selected advanced materials after inhalation. Currently, attention focuses on physicochemical characterisation of the five advanced materials (pristine as well as in their

respective matrices). In addition, current focus is on methods for their aerosolisation, including pilot testing of newly marketed equipment. Experiments are underway to pre-screen for effects of a series of advanced materials on alveolar macrophages. Both the chemical and medicine domain are represented in the selected materials and RIVM will help promote coordination between these regulatory frameworks in the field of advanced materials. As co-lead of WP1 on Bridging Communities & Refining MACRAMÉ Strategies RIVM will assess the needs of regulatory and policy frameworks.

11. Experience from stakeholder or public dialogues

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12. Any other scientific and technical issue

MSCA-NL

A strategic approach to identify and describe **potential safety, sustainability and regulatory issues of advanced materials** at early stages of their development or use is developed by the OECD WPMN Steering Group on Advanced Materials (AdMa). This strategic approach used an earlier version of the Early4AdMa system, which is adapted based on experience from case studies and other feedback. The **updated Early4AdMa system** is available at the OECD website and orally explained in a recent webinar. The relevance of further updates of the system will be considered in the future.

The system is applied to further cases: nanocarriers, graphene related material, 3D-printing as an advanced manufacturing process, SUNSHINE cases and an update for MXenes are anticipated. These cases will focus on identifying relevant signals on safety, sustainability and regulatory applicability. Delegates, organisations and projects are invited to apply the Early4AdMa system, preferably in collaboration with the OECD WPMN SG AdMa, and bring relevant AdMa to the attention of the OECD WPMN SG AdMa.

The Netherlands is co-chair of the OECD WPMN SG AdMa. RIVM has developed the first version of the Early4AdMa system together with UBA, BAuA and BfR, and contributes to various cases.

13. Classification and labelling

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Titanium dioxide: An appeal against the judgement of the General Court to delete the Annex VI to CLP entry for classification as Carc 2 has been brought by the European Commission on 14 February 2023.

Silver: The RAC opinion on the CLH for **Silver** (EC no: 231-131-3 ; CAS no: 7440-22-4) has been published. The opinion, as well as the proposal and comments received during the Consultations can then be accessed here: https://iuclid6.echa.europa.eu/web/guest/registry-of-clh-intentions-until-outcome/-/dislist/details/0b0236e183963736. Discussion is ongoing at CARACAL.

Silanamine (SID description of the substance: 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica; pyrogenic, synthetic amorphous, nano, surface treated silicon dioxide): In the RAC-65 plenary meeting in June 2023, RAC considered the request under Article 77(3)(c) (see here: https://echa.europa.eu/documents/10162/17090/rac_mandate_art77_3c_clh_sila

namine_en.pdf/231aaf84-b76a-bfc4-70e8-dba2ee08ea2e?t=1666329097573) based on a recent study conducted by Industry for reconsideration of the conclusion of RAC to classify **Silanamine** as Acute Tox 2 via the inhalation route (H330) and agreed on no classification for acute toxicity due to inconclusive data.

MWC(N)T: Discussion of the RAC opinion adopted in 2022 for **multiwalled carbon (nano) tubes** (see the ECHA website at https://echa.europa.eu/registry-of-clh-intentions-until-outcome/-/dislist/details/0b0236e18195a284) as Carc 1B and STOT RE 1 (with specific concentration limits) is ongoing at CARACAL.

14. EUON

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Completed desk-studies

The study topics are:
- Nano-specific alternative methods in human hazard/safety assessment under different EU regulations, considering the animal testing bans already in place for cosmetics and their ingredients
- A study on valid in silico modelling tools and read-across approaches, including creation of case studies on read-across for specific (types of) nanomaterials

On-going desk-studies

Expected completions by mid-June 2024:
- Collection and review of information on nanomaterial-based and nano-enabled plant protection products, biocidal products and fertilising products
- Review of the potential for release of nanoparticles from products and articles with embedded nanomaterials and the possible toxicity of the released nanoparticles

Desk-studies to be commissioned

Estimated contract starts June 2024:
- Information on nano-enabled textiles
- Survey on state of the art of carbon-based nanomaterial detection and quantification in environmental and biological matrices.

15. Suggestion of discussion topic for next NMEG meeting (NMEG-18)

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16.None of the above

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