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GRACIOUS data logging templates for the environmental, health and safety assessment of nanomaterials

The harmonised recording of experimental data on nanomaterial properties generated in different research projects is a key issue in nanosafety. In 2017, NANoREG¹ published a set of Excel[®] templates² aimed to facilitate the reporting of data on 33 endpoints (including 12 physicochemical properties, 9 *in vitro* mammalian toxicity assays and 12 *in vivo* mammalian toxicity assays) generated during laboratory work. Each template is based on ISA-TAB-Nano^{3,4} and relates the result of the measurement to the experimental conditions, protocols, method and instrument that have been used to generate it, thus ensuring reproducibility, comparability and re-use of the data by other scientists. More recently, GRACIOUS⁵ has decided to use some of these templates to store experimental data generated in the project and to create new templates with the same structure for physicochemical properties relevant for the project but not covered by existing NANoREG templates.

GRACIOUS partners developed 6 new Excel[®] templates for logging data on:

- Core chemical composition by X-ray Fluorescence (XRF),
- Particle size by Centrifugal Liquid Sedimentation (CLS) and Electrospray–Differential Mobility Analysis (ES-DMA),
- Surface chemistry by X-ray Photoelectron Spectroscopy (XPS),
- Specific surface area by Sears Titration (for colloidal silica), and

¹ <https://cordis.europa.eu/project/rcn/107159/factsheet/en>

² Totaro et al; Data logging templates for the environmental, health and safety assessment of nanomaterials; EUR 28137 EN; doi:10.2787/505397; January 2017

<http://publications.jrc.ec.europa.eu/repository/handle/JRC103178>

³ Thomas et al; ISA-TAB-Nano: A Specification for Sharing Nanomaterial Research Data in Spreadsheet-based Format; BMC Biotechnology 2013, 13:2 <http://biomedcentral.com/1472-6750/13/2>

⁴ <https://wiki.nci.nih.gov/display/ICR/ISA-TAB-Nano>

⁵ <https://cordis.europa.eu/project/rcn/212339/factsheet/en>

- Hydrophobicity by Contact Angle.

In addition, GRACIOUS partners updated 3 existing NANoREG templates:

- Zeta potential measured by Electrophoretic Light Scattering was modified through the insertion of a new column where the user can specify the pH value at which the measurement was performed,
- Density measured by He-pycnometry was modified through the insertion of a new column where the user can specify the number of He purging cycles of the chamber, which were operated before the measurement, and
- Crystallinity measured by X-ray Diffraction (XRD) was extended through the insertion of five columns where the user can store additional details about method and instrument.

For more information on the structure of the templates see the previous publication by Totaro et al (2017).²

The GRACIOUS templates zipped archive can be downloaded [here](#).

The templates are free to use and can be modified under Creative Commons – Share Alike license⁶. When publishing new work that relies on them as such, or after modification, please acknowledge the source: "GRACIOUS templates" and refer to the DOI (see 'How to cite' and the references box below).

This work has been performed thanks to the contribution of various GRACIOUS partners (see 'How to cite'). It is publicly released in this format by the European Commission's Joint Research Centre (JRC) for the sole purpose of anchoring the templates archive in literature via unique identifiers, as done before for NANoREG templates (see the references box below).

For further support please contact: JRC-NANOTECHNOLOGY@ec.europa.eu

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⁶ <https://creativecommons.org/licenses/by-sa/4.0/>

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