

Title of Research:

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Study on the cellular and environmental effect related with solubility of industrial nanomaterials

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Summary of Research:

A nano-object is defined as an object with one or more external dimensions being nanoscale (1-100 nm). Nano-objects have possible impacts on cellular and environmental effects and are of significant concern. However, the accumulation of toxicity evaluations under the strictly controlled experiments teaches us the essential factor that is concern to solubility of nano-object. To confirm the solubility contribute the toxicity of nano-object, we focused on the following five issues.

1. Characterization of solubility by nano-object in the solvents.
2. Evaluation of nano-object that may cause environmental effects using microbes.
3. Studies on solubility of nano-object in the cells.
4. Evidences that solubilized yttrium ions from yttrium oxide nanoparticles cause toxicity.
5. Evaluation of cellular toxicity caused by silica nanoparticles.

Timeline: From November 2013

Topics:

Publications:

Toxicity caused by yttrium oxide nanoparticle is due to yttrium ions
Akihiro Moriyama, Ikuho Yamada, Youta Mizuno, Hitoshi Iwahashi, Junko Takahashi and Masanori Horie
The 21th Meeting of THE JAPANESE SOCIETY OF ENVIRONMENTAL TOXICOLOGY
2015 Sept. 2nd-3rd Tokyo, Japan

The effect of titanium dioxide (TiO₂) nanoparticles to microbes under Ultra Violet (UV) irradiation.
Ikuho Yamada, Youta Mizuno, Hitoshi Iwahashi, Junko Takahashi and Masanori Horie
The 21th Meeting of THE JAPANESE SOCIETY OF ENVIRONMENTAL TOXICOLOGY
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Importance of the evaluation of ion solubility from nanoparticles to cellular toxicity.
Masamitsu Fujita, Ikuho Yamada, Hitoshi Iwahashi, Masanori Horie
The 21th Meeting of THE JAPANESE SOCIETY OF ENVIRONMENTAL TOXICOLOGY
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Yamada, I. Nomura, K. Iwahashi, H. Horie, M. The effect of titanium dioxide (TiO₂) nano-objects, and their aggregates and agglomerates greater than 100 nm (NOAA) on microbes under UV irradiation. Chemosphere 143, 123-7, 2016