

Theme: ENV INFO Mailbox - Is it reasonable to consider individual (isolated) fullerene molecules as being some sort of nanomaterials?
From: Andrej.KOBE@ec.europa.eu
Data: December 15, 2011, 16:36
To whom: yard@kharkov.ua
Copy: ENV-INFO@ec.europa.eu

Dear Mr. Andrievsky,

As the member of the team working on the recommendation for the definition of nanomaterial for the regulatory purposes, I had been asked to reply to your comment.

I thank you for sharing your thinking as well the open letter with us. It includes links to In your comprehensive letter you yourself reply to most of your questions.

I

Andrej Kobe

DG ENV D.3 Chemicals and nanomaterials

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Theme: ENV INFO Mailbox - Is it reasonable to consider individual (isolated) fullerene molecules as being some sort of nanomaterials?

From: ENV-INFO@ec.europa.eu

Data: December 21, 2011, 18:11

Dear Mr. Andrievsky,

Thank you for sharing your thinking as well as the July 2010 open letter with us.

In your comprehensive letter you reply to most of your own questions already:

You identify that at least some fullerenes would not fall under the definition as they are smaller than the 1nm size threshold. They are therefore explicitly and deliberately listed (i.e. included in the definition by convention) by the additional point 3, unlike similar size bio- or macromolecules that you also indicate in your letter. Such listing also excludes the potential discussion whether you would consider fullerenes as particles or not.

Regarding the rationale for such explicit inclusion of fullerenes (and also grapheme and SWCNT), again you have identified it yourself: these materials are, by common understanding and since their invention, associated with the nanotechnology. They are being financed/investigated in nano-research, used in (claimed) nano-enabled products and other applications of nanotechnology. In the regulatory context such association must be considered. Their inclusion has also been explicitly requested in several responses to the 2010 public consultation.

We plan to revisit the Commission recommendation in 2014. We will consider at the time whether new information, from science as well as from the experience with the regulatory uptake of the definition, will warrant a new and different look at the fullerenes. Stakeholders will be consulted.

For more information, with answers to some commonly asked questions regarding the definition, I encourage you to check our webpage at:

http://ec.europa.eu/environment/chemicals/nanotech/questions_answers.htm

Kind regards, and all the best in 2012

Ann Maher

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LinkedIn Groups
Group: Nano Technology
November 23, 2011

Dear Grigoriy,

I have seen your comment. Someone forwarded it to me. And you will be happy to find out that we just had an interesting and heated debate about this definition at the ISO 229 conference in Johannesburg. I will be covering all aspects of that EU Definition and the shortfalls - including the ones that you rightly spotted. Indeed according to the size range fullerenes or graphene will not be classed as a nanomaterial. This point of view is not universally shared, so we will have to wait and see what this debate produces. This debate will be fully discussed at the 30 Nov event in Brussels.

Best regards

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November 24, 2011

LinkedIn Groups

Group: NANO-SAFETY

Discussion: Is it reasonable to consider individual (isolated) fullerene molecules as being some sort of nanomaterials?

Grigoriy,

your question is understandable, but as single fullerenes (e.g. C60) are about 1,018 nm in diameter, they belong per ISO definition to nano material. Also gold clusters (that are even used as nano standard material) are chemically molecules only. The definition of nano implements special properties bound to size and this is the fact for fullerenes.

Posted by Wolfgang

Wolfgang L.

GF bei SICO scientific industrial consulting office

Hamburg Area, Germany

Dear Wolfgang,

"1.018 nm" - this size is not true value of diameter of C60 molecule, and, with the account of Van der Waals radius, it is centre to centre distance between two adjacent C60 molecules in crystals (not in vacuum) in which besides C60 molecules rotate freely enough .

OK! But what to do with others nanosized molecules?

And, in my opinion, application of term "cluster" in relation to a molecule is not correct as in typical molecule its atoms are combined by means of strong chemical bonds, but in clusters their primary elements are combined due to either of weak chemical bonds (like hydrogen bonds) formations, or another weak electrostatic and dispersion interactions.

And, gold "clusters", which you have mentioned, is a typical example of a carcass-like (cage-like) molecules, but not cluster.

Grigoriy Andrievsky

November 25, 2011

Grigoriy, you are perfectly right. Common speech about nano particles is today still very unprecise. As a chemist I should have been more precise in my terminology, but as I see you have got the message: To reduce the possible danger of particles just to their size, only shows the fear to being late with warning. To me it is a problematic actionism based on fear without knowledge about scientific details, honorably driven by a good will to be protective, but very often also by populism only. Warning of nano makes it easier to raise money for research projects.

Posted by Wolfgang