

## Nanotechnology: TSCA Update

EPA's Chemical Control Division is closing in on its position about when nanoscale materials constitute a new "particular molecular identity," which is the TSCA criterion for determining that a material is a "new chemical substance" and which triggers the PMN requirement. Regarding carbon nanotubes (CNTs), the Agency appears to be focusing on whether the physical structure and physical-chemical properties are comparable to amorphous carbon (CASRN-7440-44-0) or its two crystalline allotropic forms, namely graphite (CASRN 7782-42-5) and diamond (CASRN 7782-40-3), all three of which are listed on the TSCA Inventory. As a practical matter, EPA wants to determine whether the CNT has the same crystalline form as graphite, carbon or diamond and whether the CNT has any unique physical-chemical properties, qualitatively (not just quantitatively) different from those of graphite, carbon or diamond.

In the early 1990s, EPA took the position (in responses to Union Carbide and 3M) that "physical form" did not matter in determining molecular identity:

*In as much as the chemical compositions of the various physical forms are the same, EPA does not consider the different physical forms of silica to be separately reportable under TSCA. For the purposes of TSCA, the various physical forms of silica (SiO<sub>2</sub>) are all considered to be included under the CASRN 7631-86-9, which is on the TSCA inventory.\**

From this decade-old position, industry probably has understood "physical form" to mean crystalline (or 3-dimensional) structure as distinct from chemical composition (the atoms comprising the molecule). Recently EPA has attempted to clarify its use of the term "physical form," however, as intended to address different appearances within the same solid state rather than different crystalline structures, noting that the different physical forms of silica addressed its advice to 3M and Union Carbide were all the same crystalline structure: amorphous silica. EPA's forthcoming guidance on the molecular identity of nanomaterials, whether a change or simply a clarification of prior policy, could constitute a useful defense should the Agency attempt enforcement action against nanomaterials already placed on the market in reliance on industry's longstanding understanding of EPA policy.

In late September, Jim Willis, Director of the Chemical Control Division, reported several new developments in the nanomaterial field:

- Administrator Johnson just gave his support to OPPT's Nanotech Stewardship Program, which OPPT plans to roll out rapidly;
- within one month, OPPT intends to issue industry guidance on when a nanomaterial constitutes a new chemical substance for TSCA PMN purposes;
- OPPT intends nothing "radical" in its pronouncements on nanotechnology, recognizing that changes to its longstanding TSCA policies to address nanotechnology should be gradual; and
- recognizing that many nanomaterials, including CNTs, are on the market already, OPPT plans to consult with EPA enforcement about appropriate compliance oversight, implying thereby a more lenient than aggressive enforcement posture.

Consequently, nanotechnology companies very soon will need to assess the TSCA compliance of their existing nanomaterials in light of EPA's forthcoming guidance.

### CONTACTS

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\*Letter to D.R. Rink, Union Carbide Chemicals and Plastics Company Inc., from Henry P. Lau, Chief, Chemical Inventory Section, EPA, IC-4057 (May 19, 1992)

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