

Task Group 1 Charge

MWCNT Measurement Methods

The charge for Task Group 1 is as follows:

- (1) Identify processes, procedures, and equipment currently used to release multi-walled carbon nanotubes (MWCNTs¹) from products² and articles³ in a controlled manner
- (2) Establish the needs and requirements for improved and/or new processes, procedures, and equipment to release MWCNTs from products and articles in a controlled manner
- (3) Identify existing measurement methods to detect and characterize MWCNTs released from products and articles. Methods in use for other types of nanomaterials, *e.g.*, silica, should also be considered
- (4) Establish the needs and requirements for improved and/or new measurement methods to detect and characterize MWCNTs released from products and articles
- (5) Establish approaches to validate and, if possible, standardize existing and new measurement methods through means such as interlaboratory testing

Measurement methods shall be developed that are relevant to the **priority release scenarios** developed in Task Group 3, *i.e.*, realistic exposure media during the full product-article lifecycle that involve the product-article workforce, consumers of articles, and the environment. Of primary concern are measurements of MWCNTs **immediately after their release**⁴ from products and articles. Some of the specific needs for (1) to (4) above are as follows:

- (1) Release mechanisms: *rate and extent of release*
- (2) Detection: *sampling and collection; concentration in media*
- (3) Physico-chemical properties: *physical dimensions and morphology*
- (4) Transformations: *physical and chemical transformations that affect detection*

Task Group 1 is encouraged to utilize the NNI 2011 Environmental, Health, and Safety Research Strategy⁵ as a resource, particularly the Research Category “Nanomaterial Measurement Infrastructure” that details the above needs. Additionally, the Research Categories “Human Health Exposure” and “Environment” may provide useful context for Task Group 1.

¹ Includes individual MWCNTs as well as pieces of matrix material containing MWCNTs

² Product is defined as the commercial base material that is used to fabricate articles. Example of products are solid blocks of MWCNT/polymer matrix material and polymer pellets impregnated with MWCNT

³ Article is defined as a finished commercial item, *e.g.*, a tennis racket or car part, fabricated from a product.

Typically, different companies fabricate products and manufacture articles.

⁴ The time scale of interest is minutes as opposed to hours or days.

⁵ See <http://www.nano.gov/node/651>