



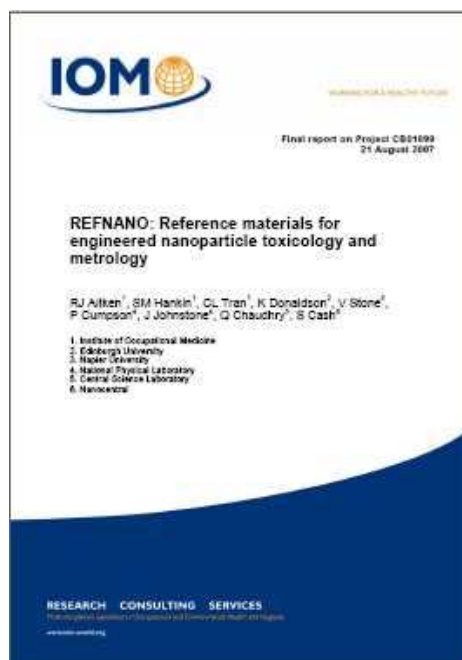
REFNANO: The UK-led initiative on Reference Materials for Nanotechnology

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Reference materials have long served industry, academia and government in the advancement of scientific and technological research and development. They are materials or substances one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. Reference materials are currently available for use in areas such as industrial materials production and analysis, environmental analysis, health measurements and basic measurements in science and metrology.

With the ever-increasing presence of nanometre-sized materials in new consumer and industrial products, there has been a substantial increase in research into the manufacture, characterisation, application, and effects of nanomaterials. This is evident through the activity of the UK Government's Nanotechnology Research Coordination Group. Working Groups, established in response to the seminal report from the Royal Society and Royal Academy of Engineering on nanoscience and nanotechnologies, are key drivers towards the further development of reference materials. It is against this backdrop that the potential role of reference materials in toxicology and metrology has been identified and further steps have been taken towards identifying the key materials that would be of benefit to the nanotechnology community.

Put simply, it is a reference material's ability (ideally) to verify the accuracy of specific measurements that offers the prospect for more comparable data across a range of scientific and technological developments in nanotechnology.



Box 1: Priority Candidates for Reference Nanomaterials

- carbon black
- TiO₂
- ZnO
- polystyrene
- SWCNT & MWCNT
- Ag
- other key metals & metal oxides (e.g. Cu, Ni, Fe, Zn and their oxides) combustion-derived nanoparticles

prioritised list of candidates for inclusion in a set of reference materials to support measurement, toxicology and risk assessment of engineered nanoparticles in the UK. The prioritised candidates



(listed in box 1) are toxicologically and industrially relevant at the nano-scale and focus on materials produced and used in the UK.

Although perhaps the first to document a prioritised set of candidate materials, their selection criteria and development strategy, it is clear that the recommendations from the REFNANO project stand to be realised more efficiently and to far greater impact when integrated with other national and international initiatives addressing the need for reference nanomaterials. The REFNANO findings provide, at the very least, a starting point for the further consideration of reference materials for nanotechnology anticipated elsewhere around the world.

[Please click here to download and read REFNANO.](#)

*Steve Hankin,
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