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Synthesis and Characterization of Nanomaterials

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Nanomaterial is defined a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50 % or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm to 100 nm. Nanomaterials not only differ from the corresponding bulk materials in morphological properties but they can also demonstrate different physico-chemical characteristics. Manufactured nanomaterials are regarded as key components of innovations in various fields with high potential impact, such as energy generation and storage, electronics, photonics, diagnostics, integrated sensors, semiconductors, foods, textiles, structural materials, sunscreens, cosmetics, and coatings or drug delivery systems, and medical imaging equipment. Widespread use of nanomaterials raises concerns about their safety for humans and the environment, possibly limiting the impact of the nanotechnology-based innovation. The development of safe nanomaterials has to result in a safe, as well as functional material or product. Its safe use, and disposal at the end of its life cycle must be taken into account too. Responsibility for the safe handling of synthetic nanomaterials therefore rests with the manufacturer and importer. This book gathers and reviews the collection of five contributions (four articles and one review), with authors from Europe and America accepted for publication in the aforementioned Special Issue of *Fibers*.

