Semi-quantitative analysis of solid waste flows from nano-enabled consumer products in Europe, Denmark and the United Kingdom - Abundance, distribution and management - DTU Orbit (21/04/2019)

Semi-quantitative analysis of solid waste flows from nano-enabled consumer products in Europe, Denmark and the United Kingdom - Abundance, distribution and management

Many nano-enabled consumer products are known to be in the global market. At the same, little is known about the quantity, type, location etc. of the engineered nanomaterials (ENMs) inside the products. This limits the scientific investigations of potential environmental effects of these materials, and especially the knowledge of ENM behaviour and potential effects at the end-of-life stage of the products is scarce. To gain a better understanding of the end-of-life waste treatment of nano-enabled consumer product, we provide an overview of the ENMs flowing into and throughout waste systems in Europe, Denmark and the United Kingdom. Using a nanoproduct inventory (nanodb.dk), we performed a four-step analysis to estimate the most abundant ENMs and in which waste fractions they are present. We found that in terms of number of products: (i) nano silver is the most used ENM in consumer products, and (ii) plastic from used product containers is the largest waste fraction also comprising a large variety of ENMs, though possibly in very small masses. Also, we showed that the local waste management system can influence the distribution of ENMs. It is recommended that future research focus on recycling and landfilling of nano-enabled products since these compartments represent hot spots for end-of-life nanoproducts.

General information
Publication status: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, Environmental Chemistry
Contributors: Heggelund, L. R., Hansen, S. F., Astrup, T. F., Boldrin, A.
Number of pages: 9
Pages: 584-592
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 56
ISSN (Print): 0956-053X
Ratings:
  BFI (2016): BFI-level 2
  Scopus rating (2016): CiteScore 4 SJR 1.407 SNIP 2.159
  Web of Science (2016): Impact factor 4.03
Web of Science (2016): Indexed yes
Original language: English
Keywords: End-of-life, Engineered nanomaterials, Nanoproducts, Waste management
Electronic versions:
2016_WM_Heggelund_Semi_quantitative_analysis_of_solid_waste_flows_from_nano_enabled_consumer_products_Auto_archive.pdf. Embargo ended: 03/09/2018
DOIs:
10.1016/j.wasman.2016.05.030
Source: FindIt
Source-ID: 2305930367
Research output: Contribution to journal › Journal article – Annual report year: 2016 › Research › peer-review