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Nanosilver in Chemistry Class a Web Inquiry Project

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Abstract

From functional food to easy-to-clean surfaces, from smartphones to pharmaceuticals: nanotechnology is one of the key technologies of the 21st century and we encounter various nano-enabled products in many areas of our day-to-day lives - in the majority of cases without even knowing. Previous studies showed that pupils and students a) are not aware to what extend nanotechnology might influence their life and b) locate nanotechnology almost exclusively in technical relevant fields, if at all.[1] For this purpose, our article aims at highlighting the application of nano-enabled products in other, more sensitive domains, such as cosmetics, food and clothing. A particularly suitable example for the use in chemistry class are nanosilver particles; due to their antimicrobial effect they are in widespread use in different areas, e.g. deodorants, hygienic door handles, wall paints and so forth.
Since the internet already provides a fund of available nano-enabled products and causes for thought, it was intended to exploit this potential by introducing the pupils and students to the subject through a Web Inquiry Project (WIP). A WIP - described for the first time by Bernie Dodge in 1995 under the name of "WebQuest" - aims at promoting higher levels of student-centered inquiry, specifically by providing loose structure and (uninterpreted) online data for students to answer inquiry-oriented questions.[2-4]
For this reason, a WIP focused on nanoscaled silver particles in our everyday lives has been designed for K-12 chemistry education. Among other things, it will concern 1) the synthesis of nanomaterials, including easy and illustrative experiments, 2) the functional principle of nanotechnology, 3) investigation and quality management of nanomaterials and 4) the risks and benefits of nanotechnology, enabling the pupils and students to assess its application in different domains.