

The word "nanoparticles" refers to nanostructures particulated, with variable shape, but with at least one dimension in the "nanoscale", that is lower than 100 nanometers (nm). Shapes can be spherical, filamentous, tubular, and irregular. They can be formed by a variety of various functionalities. For instance they can provide contrast for materials. Nanoparticles can be dispersed, fused, agglomerated, and aggregated. The common characteristics of nanoparticles concern the diversity among properties related to dimensions and properties related to the parental chemical species. Indeed, referring to a mass value, nanoparticles have an exposed surface much higher than the same mass in shape of macro-particle. At characteristics increase significantly their chemical and biological activity.

Nanoparticles can have natural origin (coming from natural combustions such as volcanos and spontaneous fires) or they can have anthropogenic origin (coming from vehicular traffic, mainly diesel related, from industrial plants, from domestic heating).

Moreover nanoparticles can be artificially produced (from engineered processes) that is specifically produced from nanotechnologies at industrial level in order to perform technological aims in various scientific and industrial fields. For that reason the term "nanotechnologies" refers to the development and production of materials and systems in the order of nanometers.

Since long time, people have been exposed to natural and anthropogenic nanoparticles. On the contrary, artificial nanoparticles are new agents, to whom people begin to be exposed only now (and possibly will be more and more exposed). Even if nanotechnologies are considered an important opportunity in the scientific and technological development, they are seen also as a new potential risk for the human health. This risk cannot be assessed yet for lack of data. However, a lot of studies are in progress, thus important results are expected for the future even at regulatory level.

The growing interest on nanoparticles in the scientific circles is demonstrated from the dynamics of articles in the international database Scopus®. This is a wide abstract and citation database (50 million records) of peer-reviewed literature. Scopus delivers the most comprehensive overview of the world's research output in the fields of science, technology, medicine, social sciences and arts and humanities. In Figure 1 the dynamics of Scopus® indexed papers on nanoparticles is reported. In the last 10 years the amount of articles increased 7 times, reaching the considerable value of 34,919 per year (in 2013).

that the opportunities related to the nanoparticle sector, specifically as a result of the synergy between bioengineering and biomedicine, will be higher than their negative effects.

#### References

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