Nanoparticles generated during volcanic rock exploitation: An overview

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Abstract

Nanoparticles (NPs) from the mining of volcanic rocks have been a matter of concern around the world because they can pose environmental and human health risks. The nanoparticles are pointed as opportunities of application in a large field of knowledge. The aim of this study is to provide an overview of scientific publications on the success rates of mineral nanoparticles, the use of soil remineralizers as an alternative for replacing highly soluble fertilizers and their potential risk to human health and the environment. Nanoparticles were successful used as a filter agent and may act as carrier agent of metals and molecules through the environment compartments; rock powder was used as a litho-fertilizer in nature or enriched with nutrients and pesticides for plant disease control. However, nanoparticles were also identified as particle promoting of human diseases. Finally, this work addresses nanoparticles derived from volcanic rock mining and highlights the relevance of developing cleaner procedures to minimize exposure to these materials and is therefore of direct relevance to both the volcanic rock mining and agriculture sector and health.

Keywords

Health, Mining, Mineralogy, Nutrient, Sustainable agriculture