

Nanotechnology as a Tool for Sustainability Towards A "Sustainable/Economic" Assessment Tool for Nanomaterials

ABSTRACT

Technological development has a positive impact on all aspects. Sustainability is considered as a one of the most important contemporary trends, which can prevent life demands for the future. We can consider nanotechnology as a one of the modern science branches, which has achieved many developments in properties of materials with a positive impact, which have contributed to the development of many fields. So, the problem of the research can be determined in studying the integration between applied nanoscience and sustainability to introduce a system has a positive impact on sustainability through modern nanotechnologies, achieving higher levels of sustainability and advanced solutions for systems. The research aims to create an evaluation sustainable matrix for the nanomaterials that can be changed to a "sustainable/economic" scale for comparison and selection between alternatives of nanomaterials of the same applied field compared to the material in its traditional form. The study uses an organized methodology including firstly the study of the nanomaterials, and its important properties, secondly identifying the main properties for nanomaterials, which have a positive impact in achieving sustainability and thirdly creating the sustainable nanomaterials evaluation criteria to develop the proposed "sustainable/economic" tool to evaluate nanomaterial alternatives. The research provides a preliminary evaluation matrix depending on the material sustainability level and its economics and its division into four zones. The research provides also the classification of the nano thermal protection materials as a practical example to achieve the optimum sustainable building design.