Available online at www.joac.info

ISSN: 2278-1862

Journal of Applicable Chemistry

2013, 2 (5):1244-1248

(International Peer Reviewed Journal)

Nanostructure of Titanium Dioxide (TiO_2) and its Correlation with Human Health and Safety

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Received on 9th August and finalized on 20th August 2013.

ABSTRACT

The titanium dioxide with its chemical formula TiO_2 is a naturally occurring oxide of titanium. The synonyms are titanium (IV) oxide, titania, titanium white and pigment white 6. It has a wide range of applications and is employed as a pigment to provide whiteness and opacity in paints, coatings, plastics, papers, inks, sunscreens, foods and eatables, medicinal pills and tablets, toothpastes etc. TiO_2 is now one of the most fascinating materials in the modern era which is vastly capturing the attention of physical chemists, physicists, scientists, engineers, doctors and social workers in exploring its distinctive properties. As the cytotoxicity of the nanoparticles of this compound is not clearly understood, the aims of this study was to assess the cytotoxicity of TiO_2 nanopowder and to exhibit the slow poisonous/harmful effects of TiO_2 being consumed in our body by the contact, ingestion or inhalation in daily routine life. The cytotoxicity was examined in human skin fibroblasts using the colorimetric MTS in vitro assay. This study found the human skin fibroblasts sensitive to TiO_2 nanoparticles and correlated with the available in vivo and in vitro toxicity data. Accurately assessing the toxicity and safety of the nanomaterials to human health is of upmost importance and though this study will simply draw the attention but it will definitely form a base for undertaking further experimental works on the nanomaterials of other compounds and their correlation with human health safety and welfare.

Keywords: Nanostructure, Titanium Dioxide, Synonym, Pigment, Health.