

CDA POSITION STATEMENT

The Use of Nanoparticles in Sunscreens

Nanoparticles in sunscreen are tiny particles that enhance the sunscreen's cosmetic acceptability. Zinc oxide (ZnO) and titanium dioxide (TiO₂) nanoparticle containing sunscreens and cosmetics have been approved for use for many years in Europe, the United States, and Australia.

In Canada, they have been used in sunscreens since 2013.¹ Sunscreens may be organic or mineral/physical. ZnO and TiO₂ are considered "mineral" or "physical" sunscreen filters. The original sunscreens contained microparticulate ZnO and/or TiO₂ that left the skin looking white and cosmetically inelegant. Today, ultrafine nanoparticle forms are colourless yet effective at absorbing ultraviolet radiation, and are important tools in preventing sunburn, signs of skin aging, and skin cancer.

Based on the best available evidence, sunscreens containing ZnO and TiO₂ nanoparticles are not a health risk to humans. Some safety concerns have been raised because nanoparticles have the potential to form reactive oxygen species (ROS), which may cause cell damage. However, in order for nanoparticles to cause cell damage, they must first reach living cells. To date, research results have shown ZnO and TiO₂ nanoparticles in sunscreens stay on the skin.² The nanoparticles tend to "clump" together on the skin, forming large aggregates that are unable to be absorbed. Furthermore, in commercially available sunscreens, nanoparticles are coated, typically with alumina or silica, to prevent free radical formation. Health Canada requires continued safety monitoring of approved sunscreens containing nanoparticles.³ The Scientific Committee on Consumer Safety concluded no associated evidence of carcinogenicity or reproductive toxicity with skin exposure of nano-TiO₂.

1. Sunscreen Monograph Health Products and Food Branch, Health Canada July 7, 2013

2. Dréno B et al. JEADV 2019;332 (Suppl 7):34-46.

3. <https://www.canada.ca/en/health-canada/services/drugs-health-products/public-involvement-consultations/natural-healthproducts/draft-guidance-document-sunscreen-monograph-consultation-document.html>

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