

Microfine zinc oxide is a superior sunscreen ingredient to microfine titanium dioxide.

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BACKGROUND: Microfine zinc oxide and microfine titanium dioxide are particulate sunscreen ingredients that absorb broad-spectrum ultraviolet (UV) irradiation.

OBJECTIVE: We compare microfine zinc oxide and microfine titanium dioxide for their abilities to attenuate UVA radiation and their relative whiteness in cosmetic formulations.

METHODS: UVA attenuation was measured by diffuse reflectance spectroscopy on normal human skin in vivo. Whiteness was determined by reflectance density of dried coatings on a black background of the two particulates at varying concentrations

RESULTS: Microfine zinc oxide demonstrates superior protection compared to microfine titanium dioxide in the UV spectrum between 340 and 380 nm. Microfine zinc oxide is less white than titanium dioxide at all concentrations.

CONCLUSION: Microfine zinc oxide is superior to microfine titanium dioxide as a sunscreen ingredient. It is more protective against long-wave UVA and is less white at a given concentration.

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J Am Acad Dermatol. 1999 Jan; 40(1):85-90.

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- [The in vitro absorption of microfine zinc oxide and titanium dioxide through porcine skin.](#)
Toxicol In Vitro. 2006 Apr; 20(3):301-7. Epub 2005 Sep 21.
[Toxicol In Vitro. 2006]
- [In vitro assessment of the broad-spectrum ultraviolet protection of sunscreen products.](#)
J Am Acad Dermatol. 2000 Dec; 43(6):1024-35.
[J Am Acad Dermatol. 2000]
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J Am Acad Dermatol. 2008 May; 58(5 Suppl 2):S149-54.
[J Am Acad Dermatol. 2008]
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