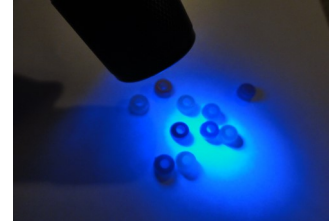


# SENIC—Nanoscale Science and Engineering

## Exploring Ultraviolet Radiation

### Explore!

1. Shine the black light over a UV bead. What happens?
2. Select a sunscreen and using a Q-tip spread some of it over a transparency square. Now place the UV bead under the square. Shine the black light on the UV beads. What happens?
3. Repeat with another sunscreen that is either more or less opaque than the first one. What happens?
4. Did one sunscreen work better than another? Was opacity important? Was nanotechnology used in the sunscreens? Did it improve the sunscreen?



UV beads are the perfect tool for understanding how solar radiation can be harmful. When you expose bare skin to sunlight, your skin will either burn or tan. UV radiation wavelengths are short enough to break chemical bonds in your skin tissue and, with prolonged exposure, your skin may wrinkle or skin cancer may appear.

# SENIC—Nanoscale Science and Engineering Exploring Ultraviolet Radiation

## Sunscreens and Nanotechnology

Why have sunscreens with inorganic agents been used less?

Particles larger than 150nm scatter visible light  
Our eyes see visible scattered light (visible range is 400-700nm)  
The scattered light is seen as a white sunscreen



## Nanotechnology to the rescue?

Inorganic particles made < 100 nm—do not scatter visible light  
Sunscreen will appear clear or translucent



<http://www.keys-soap.com/solarrx.html>

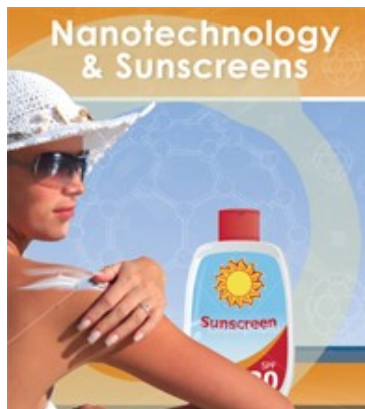


<http://allaboutskinlightening.net/wp-content/uploads/2011/05/dfgffg.jpg>

## Appearance

With advances come issues of risk. Some fear that the use of nano-sized particles of Ti and Zn pose risks to human health and the environment. Note the Australian ad at the far right stating micro-sized not nano-sized.

<http://action.foe.org>



**Micronised (Not Nano)**

**Sunscreen is the most important beauty product you can buy.**

And INVISIBLE ZINC® is unlike most other sunscreens. Addressing the risks of deeper penetrating UVA without using chemical absorbers.

INVISIBLE ZINC® face & body sunscreen forms an invisible film on the skin that acts as a barrier between you and the environment, reflecting UV light away and helping to neutralise environmental aggressors such as pollution, chemicals and smoke. High-end UV protectors that hold like a hydrating moisture. Only some of the strongest natural protectors under the sun.

INVISIBLE ZINC® is 100% mineral particles create a physical, reflective barrier on the surface of the skin and different to the chemical UV filters found in many conventional sunscreens. Zinc Oxide is a natural, mineral reflector of both high and harmful deeper penetrating UVA, delivering very high broad-spectrum SPF 30+ protection. Your INVISIBLE ZINC® physical surface layer protection every day, not just at the beach.

**Real Body Cosmetics Awards: 1st (Body Award) 2009**  
**World's Best New Beauty Product** Professional Beauty Awards, London 2009  
**Women Beauty Director's Choice Award** Real Beauty Awards 2007  
**The Best Sunscreen on the Market** US Review 2008

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