Visible-Light Nanocomposite Photocatalysts

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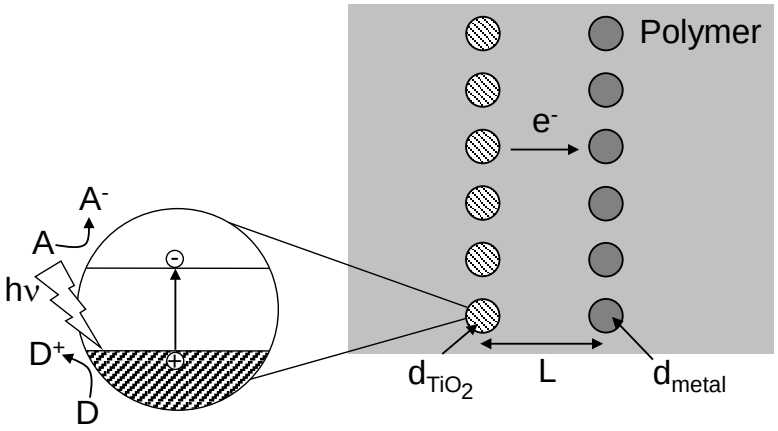
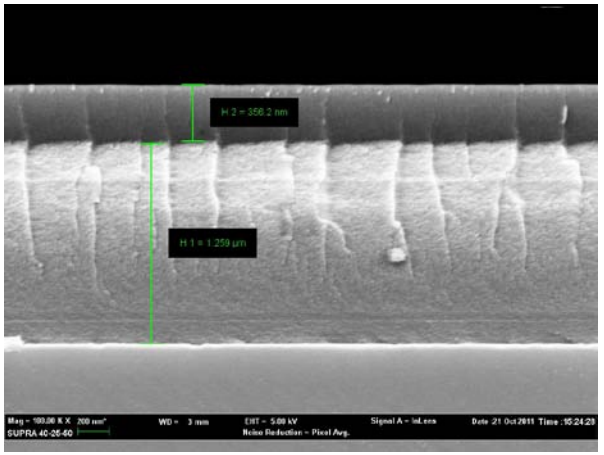
A new class of visible-light nanocomposite photocatalysts will be developed by layering metal oxide, titanium dioxide and zinc oxide, metal nanoparticles in a plasma polymer matrix. These photocatalysts have many advantages over current titanium dioxide photocatalysts:

- They are flexible
- They can conformally coat a variety of surfaces, including clothing and vehicles
- They can be used in continuous flow systems.
- New synergistic reaction pathways make these materials more catalytically active than traditional photocatalysts.

Inorganic-organic nanocomposite materials with tunable properties also have applications in other technologies including sensing, optoelectronics, drug delivery and biotechnology.





Cross-section of a bilayer film structure grown on a silicon substrate. First, a ~1.3 μm thick layer of plasma polymerized hexane was deposited followed by an ~400 nm thick film of plasma polymerized hexane containing 100 nm Si nanoparticles.