Semiconductor-Metal Hybrid Nanoparticles as Photocatalysts (Yissum)

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Efficient photocatalysts for splitting water and air and water purification

Categories	Nanotechnology, Cleantech, Energy, Water Technologies
Development Stage	Proof of concept in photocatalysis of model compounds
Patent Status	Patent Applications filed in US, Europe, Israel, Japan, Korea

Highlights

- Hybrid nanoparticles consisting of metal and semiconductor material produce efficient photocatalysts for chemical reactions, splitting water, decontamination and other applications
- Can be used to harness solar energy and generate hydrogen from splitting water or produce electrical energy in a photovoltaic cell
- Improved light harnessing efficiency, better tuned to the solar spectrum, over previous photocatalysts which were limited to UV light (that is 5% of the solar spectrum)

Our Innovation

Advances in nanotechnology have enabled the development of hybrid nanoparticles of metals and semiconductor material that can be highly controlled in size, shape and chemical composition, providing catalysts for use in various photocatalytic reactions and other applications employing light induced charge separation under visible light irradiation.

Key Features

- Efficient activity in visible spectrum
- May be used for decomposing contaminants in air, water and on surfaces
- Ability to strictly control particle size and composition

Development Milestones

- Material development combining various nanoscale semiconductors and metals and with different geometries
- Ongoing work using the photocatalysts for different chemical reactions, working towards splitting water
- Experiments to increase activity and efficiency by controlling the particle size, materials used and other parameters

The Opportunity

- New family of materials for photocatalysis
- Visible light activity of the photocatalyst to operate under solar irradiation

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