

The Global Market for Photocatalytic Materials and Coatings 2022-2032

<https://marketpublishers.com/r/G9A5C7CB380DEN.html>

Date: April 2022

Pages: 125

Price: US\$ 950.00 (Single User License)

ID: G9A5C7CB380DEN

Abstracts

The development of photocatalytic processes, materials, and chemicals offers opportunities to solve environmental issues such as clean air, pollutant degradation and provide a clean and sustainable environment via environmental remediation, CO₂ photoreduction to fuels, water splitting, H₂ production, interior bacterial and viral disinfection and suitable organic syntheses. Photocatalytic materials and chemicals offer environmentally-friendly disinfectant methods that are safe and effective for home use.

Of the many semiconductor heterogeneous photocatalysts, titanium dioxide (TiO₂) is the most widely used due to its photostability, intrinsic electronic and surface properties, non-toxicity, cost-effectiveness, and environmental friendliness. However TiO₂ photocatalysis suffers from several drawback. leading to the development of other materials such as nanoscale zinc oxide, carbon nitride g-C₃N₄, metal-organic framework (MOF) compounds., graphene-based photocatalysts, BiOCl, black phosphorus. ZnFe₂O₄, all of which are covered in this report.

Applications of photocatalytic materials and coatings include:

Self-sterilising, long-lasting clear coatings that kill viruses and bacteria for application in the home, corporate offices, restaurants and bars, healthcare facilities, industrial workplaces, hospitality and retail stores.

Degradation of pollutants and maintaining air quality.

Self-cleaning architectural glass.

Processes for treating industrial emissions.

Self-cleaning automotive glass.

Roof coatings to reduce pollution through the degradation of sulfur and nitrogen oxides.

Road and tunnel coatings.

Medical (self-disinfecting coatings)

Self-cleaning exterior paints

Coatings for the elimination of VOCs and odours in public spaces.

Water purification

Air purification (indoor)

Self-cleaning solar cell coatings.

Applications make use of the self-cleaning, anti-fogging, antimicrobial or water cleaving properties. Antimicrobial use of photocatalysis involves three components: exposure to light, a photosensitizer, and molecular oxygen. These three components combine to produce reactive oxygen species that effectively kill a wide variety of microorganisms. Their use is growing in household applications to provide long-term disinfection.

In indoor environments, most surfaces, e.g. ceramic tiles, windows glass or paper, are gradually covered with organic matter such as oils, dirt, and smoke residue and become fouled. Use of photocatalytic coatings that are activated under visible light irradiation can address these issues. Companies are now actively seeking solutions that kill bacteria using light sources commonly present in homes (near UV and visible light) including Photocatalytic processes that kill bacteria using light sources commonly present in homes (near UV and visible light); Photocatalytic processes that produce powerful sanitizers (e.g. ClO₂); and Combinations of photocatalytic processes with other chemicals that increase antimicrobial activity, particularly substances commonly used in cleaning products like chelants and surfactants.

Report contents includes:

Market drivers and trends.

Latest product and technology developments 2020-22.

Anti-viral and anti-microbial applications.

Photocatalytic coatings in glass, building and construction, pollutant degradation, indoor air filtration, water treatment, medical facilities.

In depth assessment of photocatalytic materials including titanium dioxide, zinc oxide, metal-organic frameworks (MOF), ZnFe₂O₄, carbon nitride, silica carbide, graphene oxide, BiOCl and black phosphorus.

Global market revenues, historical and forecast to 2032.

More than 60 company profiles. Companies profiled include Advanced Materials-JTJ s.r.o., AM Technology Ltd., Daicel FineChem Ltd., Envision SQ, MACOMA Environmental Technologies, LLC, Maeda Kougyou Co Ltd., Nanoksi Finland Oy, ProfMOF AS, Pureti, Swift Coat Inc and more.

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