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The Global Market for Perovskite Materials and Technologies 2025-2035

https://marketpublishers.com/r/G01B54816DD8EN.html
Date: January 2025
Pages: 253
Price: US$ 1,300.00 (Single User License)
ID: G01B54816DD8EN

Abstracts

The global market for perovskite materials and technologies is experiencing rapid growth and attracting significant attention from researchers, industries, and investors worldwide. Perovskites, a class of materials with a unique crystalline structure, have emerged as a promising solution for various applications due to their exceptional optoelectronic properties, low-cost production, and versatility. The primary driver of the perovskite market is the increasing demand for high-efficiency, cost-effective, and sustainable energy solutions. Perovskite solar cells (PSCs) have demonstrated remarkable progress in recent years, with power conversion efficiencies now exceeding 25% (from 3% in 2009) in laboratory settings. This positions PSCs as a potential challenger to traditional silicon-based photovoltaics. The ability to produce perovskite films through low-temperature, solution-based processes makes them attractive for scalable manufacturing and integration with flexible substrates. They offer low production costs, high energy efficiency, and adaptability for flexible and glass substrates.

Beyond photovoltaics, perovskites are finding applications in light-emitting devices (LEDs), photodetectors, sensors, transistors, memory devices, and catalysis. Perovskite LEDs, known as PeLEDs, offer high color purity, tunability, and low-cost fabrication, making them suitable for display and lighting applications. Perovskite-based photodetectors and sensors exhibit high sensitivity, wide spectral response, and fast response times, with potential uses in imaging, surveillance, and environmental monitoring.

The perovskite market is still in its early stages. However, the market is expected to grow significantly in the coming years, driven by the increasing adoption of perovskite-based products and the scaling up of manufacturing processes. The global perovskite

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market will exceed $10 billion by 2035, with the photovoltaics segment accounting for the largest share. The future outlook for perovskite materials and technologies is promising, with ongoing research focused on improving stability, durability, and performance. Tandem architectures, combining perovskites with other established technologies like silicon or CIGS, are expected to push power conversion efficiencies. Flexible and wearable perovskite devices, such as solar-powered clothing and sensors, are also on the horizon. Perovskite quantum dots are attracting interest for their potential in display and lighting applications, offering improved color gamut and energy efficiency compared to conventional materials.

However, challenges remain in terms of long-term stability/efficiency, scalability, and the presence of toxic lead in some perovskite formulations. Researchers are actively exploring lead-free alternatives and encapsulation techniques to address these concerns.

The report covers the following key aspects:

Overview of perovskite materials and their unique properties

Types of perovskites: inorganic, hybrid organic-inorganic, and perovskite quantum dots

Advantages of perovskites over traditional materials

Perovskite applications and end-use markets

Photovoltaics: perovskite solar cells (PSCs), tandem solar cells, and building-integrated photovoltaics (BIPV)

Light-emitting devices: perovskite LEDs (PeLEDs), white light-emitting devices, lasers, and optical amplifiers

Photodetectors and sensors: visible light, X-ray, gamma-ray, chemical, and humidity sensors

Transistors and memory devices: field-effect transistors (FETs) and resistive random-access memory (RRAM)

Catalysis and photocatalysis: water splitting, hydrogen production, CO2

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reduction, and pollutant degradation

Thermoelectrics and other emerging applications

Perovskite synthesis and processing methods

Solution-based methods: one-step deposition, two-step sequential deposition, and anti-solvent assisted crystallization

Vapor deposition methods: thermal evaporation, co-evaporation, and chemical vapor deposition (CVD)

Scalable processing techniques: inkjet printing, blade coating, slot-die coating, and spray coating

Roll-to-roll processing for high-volume production and cost reduction

Post-synthesis processing techniques: thermal annealing, solvent annealing, and pressure-assisted annealing

Market drivers and restraints

Market forecasts and regional analysis

Global perovskite materials and technologies market size and growth rate from 2025 to 2035

Market segmentation by application, material type, and geographic region

Detailed market forecasts for North America, Europe, Asia-Pacific, and the Rest of the World

Competitive landscape and company profiles

Profiles of over 65 key players in the perovskite industry, including material suppliers and device manufacturers. Companies profiled include Aisin Corporation, Anker, Ascent Solar, Astronergy, Avantama, Beyond Silicon, Caelux, BrightComSol, Canadian Solar, Canon, China Huaneng Group Co., Ltd., Cosmos Innovation, CubicPV, DaZheng, Dyenamo, EneCoat

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Technologies, Energy Materials Corporation, Ergis Group, Flexell Space, GCL, Green Science Alliance Co., Ltd., Hangzhou Xianna Optoelectronic Technology Co., Ltd., Hanwha Qcells, Hefei BOE Solar Technology, Helio Display Materials, HETE Photo Electricity, Hiking PV, Homerun Resources, Huasun Energy (Ningxia Huasun New Materials Technology), JA Solar, Jiangsu Xiehang Energy Technology (Fellow Energy/Xiehang Energy), Jinko Solar, Kaneka Corporation, Koreakiyon, LONGi Green Energy Technology, Mellow Energy, Microquanta Semiconductor, Nanolumi, Nexwafe, Opteria, Oxford PV, PEROLED Korea, PeroNova, Perovskia Solar, Power Roll, PXP, Renshine Solar, RISEN, Saule Technologies, SCHOTT, SEI Energy Technology (Jiaxing), Sekisui Chemical Co Ltd, SN Display Co., Ltd., Sofab Inks, Solaronix, Solaveni GmbH, Solaires Enterprises, and more....

Analysis of their strategies, partnerships, and product offerings

Regulations and environmental considerations

Future trends and opportunities

Tandem solar cells and perovskite-silicon integration

Flexible and wearable perovskite devices

Perovskite quantum dots for displays and lighting

Perovskite-based sensors for IoT and smart cities

Recyclable and eco-friendly perovskite materials

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