Espay Solar Energy S.L.

Chemical purification method of photovoltaic panels

Overview

A method for recycling photovoltaic modules by using a wet purification process to extract silicon from the module structure. The process involves sequential alkali cleaning, pickling, and drying steps to remove contaminants and silicon residue from the module's backplate, glass. Some studies have reported different treatment technologies, including pyrolysis, stabilization, physical separation, landfill, and the use of chemicals. Each proposed treatment technique pollutes the environment and underutilizes the potential resources present in discarded solar panels (DSPs). Alkali and Acid Leaching Methods – Molten alkali leaching for selective silicon and silver recovery, wet purification with sequential alkali-acid dissolution, and sodium hydroxide followed by mixed nitric-hydrofluoric acid treatment. After chemical treatment, elements like carbon 0%, oxide 14%, sodium 1%, manganese 1%, silicon 7%, cadmium 1%, calcium 1%, and other materials are identified through. This review examines the technological surveillance of photovoltaic panel recycling through a bibliometric study of articles and patents.

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Comparison of Organic Solvents for Chemical Recycling of ...

Chemical recycling processes generally involve dissolution by organic solvents to remove the EVA encapsulant before extracting valuable materials from the cell generally via chemical etching ...

Development of eco-friendly pretreatment processes for high-purity

Glass separation technology is considered the most important in recycling existing screen-printed PV modules. Additionally, encapsulant removal or sorting technology, including EVA, must be ...

Technological Advancement in Solar Photovoltaic Recycling: A ...

Figure 5 summarizes the main methods of treatment of the photovoltaic solar panels used, highlighting the mechanical, chemical, and thermal treatments analyzed in this study.

Evaluation of environmental footprint: Life Cycle Assessment of

The first technique involves using thermal treatment to recover materials from waste solar panels, while the second method uses chemical treatment to recover polymeric layers and other ...

Sustainable Treatment of Spent Photovoltaic Solar Panels Using ...

Some studies have reported different treatment technologies, including pyrolysis, stabilization, physical separation, landfill, and the use of chemicals. Each proposed treatment technique pollutes the ...

A Chemical Approach: Disposal of Solar Panel

The study conducted by Li et al. examines the process of reclaiming essential metals from discarded solar panels, with a specific emphasis on freeing the thin-film components, and ...

Silicon Extraction from Recycled Solar Cells

In this study "Recovery of complete crystalline silicon cells from waste photovoltaic modules," a new process

combining organic solvent method and thermal treatment is provided with ...

Experimental Methodology for the Separation Materials in the ...

Different recycling processes for silicon-based modules have been reported over the past two decades, which in general combine two of these methods in different stages: mechanical, ...

A highly efficient and eco-friendly recycling process for the

The results show that a combined method of pyrolysis and chemical methods achieves a silicon extraction rate of 81.6%, effectively realizing the separation and purification of silicon from used ...

Recovery of Pure Silicon and Other Materials from Disposed Solar Cells

A method for recovering pure silicon from the disposed solar cell using chemical treatments has been presented

in this work. The use of highly toxic chemical such as hydrofluoric ...

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