

## **Recycling Treatment of Amorphous Silicon Photovoltaic Panels by High-voltage Pulse Liberation**

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[Abstract]

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Application of the high-voltage pulse crushing method in combination with physical separation techniques for efficient treatment of amorphous-type photovoltaic (PV) panels has been investigated experimentally. The amorphous-type PV panel samples were collected and analyzed to clarify their structures and compositions. The high-value metal contents of the panels were low, thus indicating that glass recovery is an important step in the treatment of amorphous-type PV panels. High-voltage pulse crushing experiments were performed by varying several parameters, including panel type, panel size, the distance between electrodes, and the voltage across these electrodes, and the effects of the crushing conditions were also examined. In addition, the high-voltage pulse crushing characteristics were clarified via comparison with the conventional crushing methods, i.e., ball mill and hammer mill crushing. The power required during high-voltage pulse crushing confirmed that the panels can be treated with low power consumption when using the proposed method. Based on the results obtained, a comprehensive processing and valuable resources recovery flow was proposed.