Imec, Kaneka achieve breakthrough in developing next-generation heterojunction solar cells

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(Phys.org) -- Kaneka and imec report a large area (6 inch semi-square) heterojunction silicon solar cell with a certified power conversion efficiency of 22.68% with an electroplated copper contact grid on top of the transparent conductive oxide layer. This breakthrough is achieved at Kaneka Osaka lab using Kaneka's copper electroplating technology which is based on imec's state-of-the-art copper electroplating knowhow.

To realize the top grid electrode in heterojunction silicon solar cells, silver screen printing is the preferred technology in the PV (photovoltaic) industry. However, a drawback of this technology is the difficulty to lower resistivity and to thin the metal line in silver screen printed contacts. As a result, efficiencies remain below optimal and cost remains relatively high. Replacing the screen-printed silver with electroplated copper overcomes the disadvantages of silver screen printing, enabling higher efficiencies and reduced fabrication costs.

Kaneka's Photovoltaics European Laboratory is located at the imec campus in Leuven (Belgium), with access to imec's state-of-the-art PV infrastructure. The collaboration between Kaneka and imec has led to the improvement of Kaneka's thin-film solar cells and the development of next-generation heterojunction cells. This development of large area Cu-plated heterojunction silicon solar cells is an important step towards a fab-compatible process on large area module integrated solar cells.

Jef Poortmans, Director PV technologies at imec: “We are excited that we could support Kaneka in developing this breakthrough results. They prove the capabilities of copper metallization for next-generation solar cells and strengthen our believe that in the future copper will play an important role in high efficiency and sustainable solar cell technology.”

Provided by IMEC