Research Hotline

UPDATE FROM THE CUTTING EDGE

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The abstracts of the recent research information appearing in Vol.12 No.1-3 of "AIST TODAY" are introduced here, classified by research areas.
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Environment and Energy

New production technology for polycrystalline silicon solar cells

Surface texturing method of wafers sliced with fixed-abrasive wire

We have developed a new surface texturing method for polycrystalline silicon solar cells. Recently, a fixed-abrasive wire (diamond wire) where diamond grits are fixed on the surface of a piano wire is attracting much interest because of its advantages such as a higher slicing speed of Si ingots and a coolant without the slurry. However, the surface texture formation on diamond-wire-sawn wafers was difficult since the surface morphology of these wafers was mirror-smooth. A new method has thus been sought to form the texturing surface with low reflectance. In our new texturing method, the wafer is sandblasted to obtain desired asperity on its surface. Subsequently, the wafer is immersed in a newly developed acid-etching solution to form a uniform surface texture with low reflectance. The polycrystalline Si solar cells fabricated using this method have exhibited good performance. This method is inexpensive and suitable for industrial-scale production.

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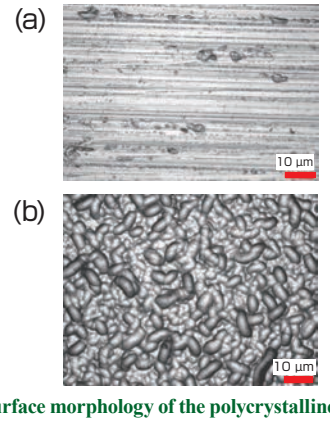
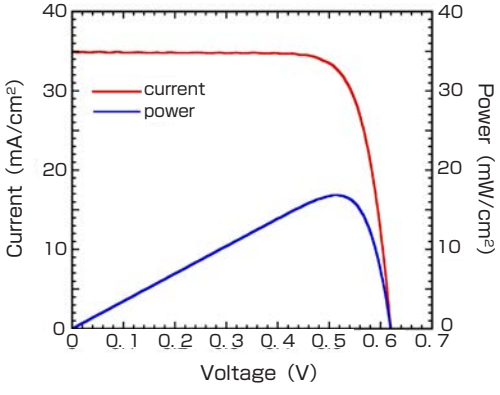


Surface morphology of the polycrystalline Si wafers
(a) The wafer sliced with a fixed-abrasive wire
(b) The surface structure textured with our method



Current-voltage characteristic of the solar cell