

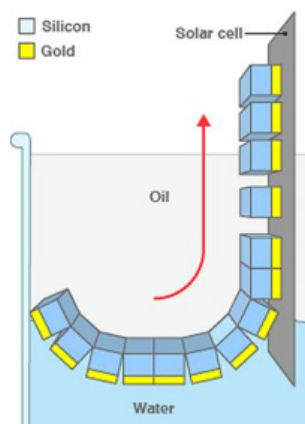


Self-Assembling Silicon Solar Cells Could Make Cheap & Flexible Panels



By [Ovidiu](#)
on January 15th, 2010

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There are always solutions for everything; all you need is to find them. This is the case for silicon solar cells, who recently lost some field because of the invention of other types of flexible, but not so efficient solar cells. Still, silicon cells have another word to say, as two University of Minnesota researchers, J. Knuesel and Heiko O. Jacobs discovered a basic, low-tech method of making micrometric solar cells self-assemble onto anything, including flexible surfaces.

The method works this way: a flexible, thin layer of copper is covered with propylene-terephthalate (PET). In other words, the copper is covered with a plastic similar to that of your water bottle, but much more resistant to heat. Then they dig holes into the layer of PET of the same size as the chipllets they want to plant there. The sheet is then dipped into a bath of molten solder which coats the

exposed copper in the etched depressions.

Each solar cell [chipllet](#) with the sizes of 20-60 μm has one of its faces covered with gold. The silicon sides have a hydrophobic (water-repelling) coating, while gold has a hydrophilic (water-attracting) one.

The next step is the one deciding how the minuscule solar cells will be assembled. The chipllets are now placed in a container containing oil and water (at 95 °C and pH 2.0, to keep the solder liquid), where they align themselves at the boundary of the two liquids, with the gold side facing down, to the water layer.

The copper-PET substrate is then pulled slowly through the boundary like a conveyor belt, and the silicon chipllets align themselves exactly in the place in the depressions, with the gold side attracted by solder, with an accuracy of 98%. The whole thing is then covered in epoxy to keep the chipllets in place, and then a conducting electrode layer is added.

elements in as little as three minutes. If used in automatically lower the assembly time for variously-sized ot.

ly be used in the fabrication of solar cells, but also electronic devices, which had been very difficult to solar cells a change of reviving and get into an area solar panels.

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