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New Steps Made in Self Assembly Electronics

by CHRIS on JANUARY 13, 2010

Reporting in the Proceedings of the National Academy of Sciences, a group of researchers from the University of Minnesota have explained a new way that could spell the future direction for self-assembly electronics. Using the theory that water and oil based liquids will not mix, the team showed how electronic components of high quality could be created by utilising components to automatically align themselves along the boundary of the compounds used.

Up until now, the study of self-assembly has largely been focussed on a process called "sedimentation" where a liquid is allowed to settle out into a pre-determined mould. However, research leader Heiko Jacobs expressed that simply allowing gravity to work on a substance didn't produce high quality items. The team then furthered research by looking at how a two-dimensional sheet could be placed between two repelling layers such as oil and water. Using a depression mould created to build solar cell elements, they prepared tiny stacks of the elements needed, gold and silicon. They then applied hydrophobic molecules to one side of the silicon, and hydrophilic ones to a single side of the gold element. By determining the exact quantities of oil and water required, the team then managed to create individual solar elements by simply letting the repelling forces push the compounds together.

Responding to the research, nano-engineering professor at Seattle's University of Washington, Babak Parviz explained that the experiment was "clear demonstration that self-assembly is applicable across size scales".

"Self-assembly is probably the best method for integrating high-performance materials onto unconventional substrates. For example, this method allows one to use single-crystal silicon, which is far superior to other types of silicon for making solar cells," he added.

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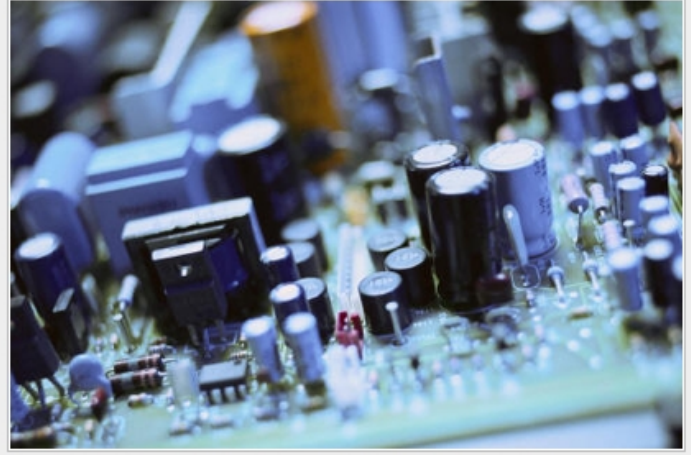
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