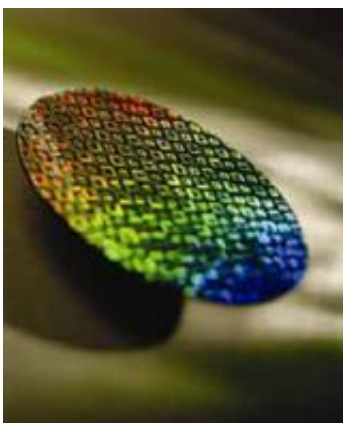


# Organic chips - not just in your kitchen anymore

February 22 2011, by Katie Gatto

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A silicon wafer. (Image courtesy of NASA Space Research)

(PhysOrg.com) -- IMEC researchers at the International Solid-State Circuits Conference, in San Francisco, California are expected to introduce a microprocessor made with organic semiconductors.

This breakthrough, which will be a world's first, is going to have the [processing power](#) of a chip from roughly the 1970's, with a 4000-transistor, 8-bit logic circuit. This is admittedly, not an amazing amount of power but this little chip, unlike its metal counterparts, is able to bend without breaking. So, while you may not be supercomputing with organic semiconductors anytime in the near future, these cheaper and more flexible chips could be used in a variety of flexible displays or to create sensors in areas where normal chips could never go.

Organic semiconductors do have one major difference from their silicon cousins. In a [silicon transistors](#) the chips have a monocrystalline structure that creates switches that act in a very predictable manner. When the voltage is above the known threshold the switch will turn on.

In the organic version of the transistors, silicon has been replaced by an unnamed [polymer](#) that is a bit more unpredictable, each chip will have a slightly different switching threshold. In display based applications, such as in e-readers, this does not notably effect the performance of the device, but in a single transistor this variance can keep the chip from working properly.

In order to solve this problem researchers built an extra gate into the back of each transistor on the 25-micrometer-thick chip. The chip is backed by an extremely thin polyethylene naphthalate, which is about the thickness of the plastic wrap found in the average kitchen. Currently creating the chip is about one tenth the cost of more traditional chips.

**More information:** [www2.imec.be/be\\_en/education/p...ide-electronics.html](http://www2.imec.be/be_en/education/p...ide-electronics.html)  
via [IEEE](#)

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