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**FETs and LEDs on glass and plastic substrates**

October 28, 2003

Researchers built FETs and LEDs of Si and GaN nanowires on glass and plastic substrates. The components had good mobility. The good performance and great robustness opens the way to a wide range of applications.

Source: Nano Letters, 10. Oktober 2003

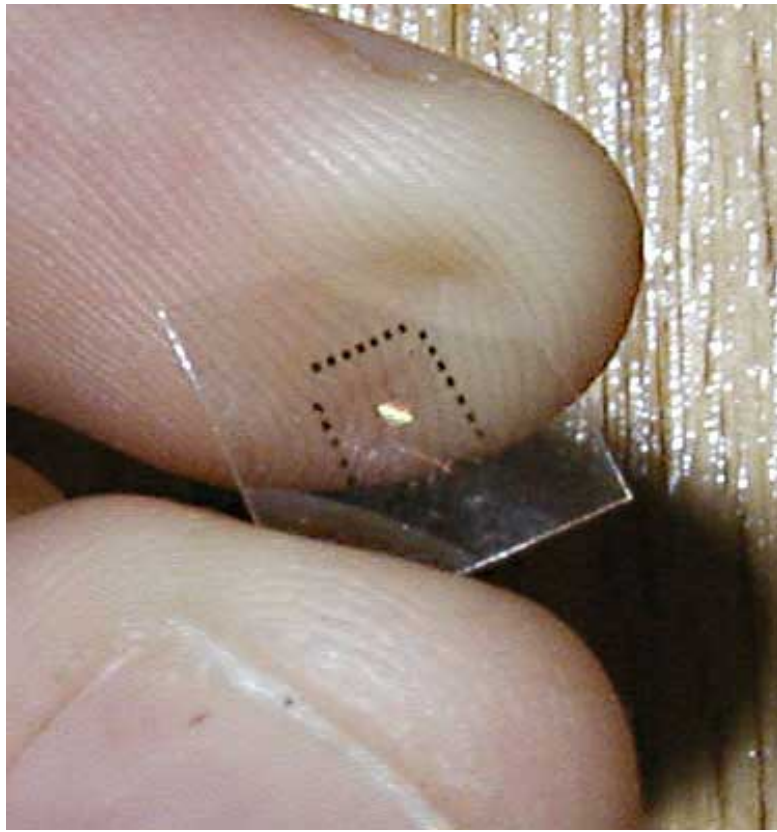
The researchers grew single crystalline nanowires which were then dispersed in a liquid. They were then deposited from this suspension onto the corresponding substrates. In order to produce single crystalline, qualitative high-grade nanowires, high temperatures are necessary, the rest of the procedure can take place at moderate temperatures so that substrates such as glass or plastic could be utilized without them suffering any damage.

The team produced an FET of p-type Si nanowires on glass with a mobility of 365 cm<sup>2</sup>/Vs. Using the same method, they created an FET on a plastic substrate with a mobility of 135 cm<sup>2</sup>/Vs. As a result, these components have a mobility comparable or even considerably higher than a p-polycrystalline Si transistor on glass and approx. 2-3 orders of magnitude better than with transistors of amorphous Si and plastic on glass or plastic substrates. The components do not lose their good characteristics even on bending (curve radius: 0.3 cm).

The team also produced LEDs of crossed n-type GaN and p-type Si nanowires on plastic. Here, the nanowires were aligned by the flow direction. The second layer was deposited in a flow direction vertical to the first one. The LEDs created in this way emitted in the UV range.

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A chip on a plastic substrate created by means of the new process. (Source: Harvard University, Cambridge, USA)

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