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US engineers harness palladium in nanotechnology breakthrough - 25th June 2003

Engineers in the US say they have used palladium to develop a way to grow silicon nanowires and carbon nanotubes directly on microstructures, thus paving the way for cheaper and faster commercialisation of a myriad of nanotechnology-based devices.

Researchers at the University of California, Berkeley, say by using a gold-palladium alloy with silane vapour to create silicon nanowires, and a nickel-iron alloy with acetylene vapour to create carbon nanotubes, they can precisely localise the extreme heat necessary for growth.

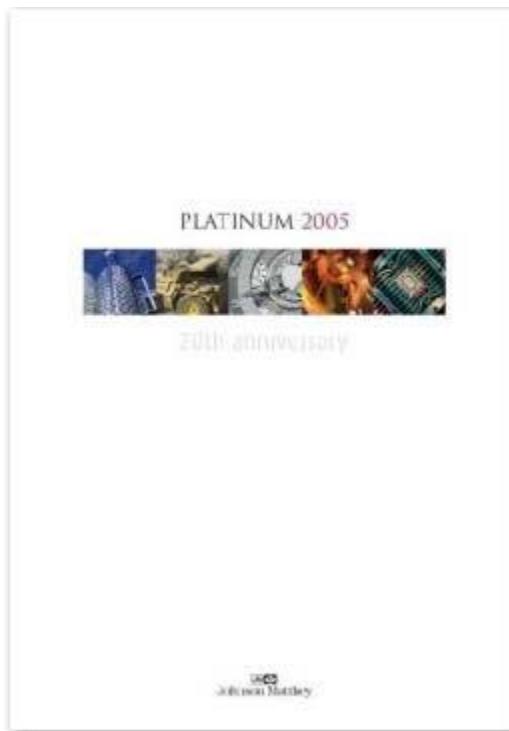
The new technique, which is described in the latest issue of the journal Applied Physics Letters, eradicates a series of cumbersome stages in the manufacturing process of sensors that incorporate nanotubes or nanowires.

'One very big problem right now is figuring out how to assemble these nanowires or nanotubes onto a microchip in a way that is commercially feasible,' explained Liwei Lin, associate professor of mechanical engineering at UC Berkeley.

The steps used in creating nanowires and nanotubes are essentially the same, though different chemicals and temperatures may be used, with the particular combination essential to the optimal success of the process.

'It's like a recipe,' said lead author of the paper, Ongi Englander. 'Different ingredients are used depending upon whether you want to make a chocolate chip muffin or a banana nut muffin, but the steps are more or less the same.'

Devices that might use the technology being developed might include early-stage disease detectors that could signal the presence of a single virus or an ultra-sensitive biochemical sensor triggered by mere molecules of a toxic agent.



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