Carbon Fullerene Micromotors, 3 March 92

Ian Pearson, Futurologist

I guess this one was just an update of one of the parts of the previous year's 'uses of carbon fullerenes'

Carbon Fullerene Micromotors

The third form of carbon (buckminsterfullerene) may be of use in micromachine technology. In the spherical and cylindrical forms, the carbon can be used as a container for other atoms. In the spherical form, it is already realised that atoms of many elements can be 'shrink wrapped' in carbon. This will yield many uses in the next few years. If several iron atoms are enclosed in a carbon tube, this could be made into a very small micro magnet, without the problems of the iron interacting with its environment. This would be much better than coating iron with other materials, which would generally be much more bulky. Having obtained these small magnets, and using them as a core, and perhaps using other carbon cylinders as the wires, very small step motors could be produced, in which the wires may be superconducting, with resulting low power wastage and low heat production. Possibly the forces obtainable from such devices would be very much better than electrostatic motors. These should be very chemically stable, since there are no spare bonds in the molecules. It is idle speculation at the moment, but it may also prove possible to produce a shuttle device, in which carbon molecule containers are passed up and down a larger tube of carbon, using magnetic propulsion. This may have some use but I can't think what. The motors would be quite small since the fullerne tubes are typically 1 micron long and 30nm wide. I may have misunderstood the blurb, but apparently, the carbon tubes are possible in two forms, one of which behaves as a semiconductor, the other should conduct as well as metals.

On Chip Interconnect

These tubes may offer a solution to on-chip interconnects (or other short distance transport) where metallic conductors are inappropriate. Given their very small diameter, this may assist with miniaturisation. Imagine a micromachine carrying the little tubes around to connect the parts of the chip, rather like a micro plumber!

Ian D Pearson
642900
3/3/92