Nanotechnology paves way for super iPods

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A breakthrough by scientists from the University of Glasgow could see the storage capacity of an iPod increase 150,000 times.

Nanotechnology researchers have developed a molecule-sized switch which means that data storage can be dramatically increased without the need to increase the size of devices.

Professor Lee Cronin and Dr Malcolm Kadodwala's work would see 500,000 gigabytes squeezed onto one square inch. The current limit for the space is around 3.3 gigabytes.

The researchers believe that their development could see the number of transistors per chip rising from today's limit of 200million to well over one billion.

Professor Lee Cronin said: "What we have done is find a way to potentially increase the data storage capabilities in a radical way.

"We have been able to assemble a functional nanocluster that incorporates two electron donating groups, and position them precisely 0.32 nm apart so that they can form a totally new type of molecular switching device.

"This is unprecedented and provides a route to produce new a molecule-based switch that can be easily manipulated using an electric field.

"By taking these nano-scale clusters, just a nanometer in size, and

placing them onto a gold or carbon, we can control the switching ability. Not only is this a new type of switchable molecule, but by grafting the molecule on to metal (gold) or carbon means that we can potentially bridge the gap between traditional semiconductor devices and components for nanoscale plastic electronics.

“The key advantage of the molecule sized switch is information / transistor density in traditional semi-conductors. Molecule sized switches would lead to increasing data storage to say 4 Petabits per square inch.

“This breakthrough shows conceptually that this is possible (showing the bulk effect) but we are yet to solve the fabrication and addressing problems.

“The fact these switches work on carbon means that they could be embedded in plastic chips so silicon is not needed and the system becomes much more flexible both physically and technologically.

“Since these switches are little balls of metal oxide they are made of similar stuff to normal semi-conductors but are much easier to manipulate as discrete molecular units.

The breakthrough was reported in this month’s edition of the prestigious journal, *Nature Nanotechnology*.

Source: University of Glasgow