New EMW materials

Showa Denko K K has developed a halogen-free, heat-resistant electromagnetic wave absorption sheet that controls noise and prevents malfunctioning of mobile electronic devices such as cellphones and digital cameras.

While EMW absorption sheets are pasted on circuit boards and elements, the company explained, conventional sheets contain halogenated resins or halides to ensure flame retardance and high loading of magnetic materials in base resins.

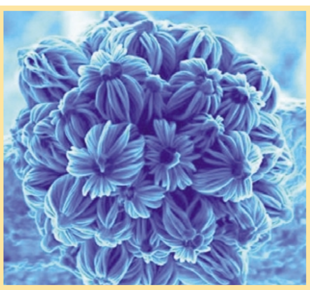
In response, Showa Denko developed environment-friendly halogen-free sheets by combining proprietary technologies for the design and processing of resin compositions, and the design and production of magnetic materials. By using magnetic properties of magnetic materials dispersed in resin, the new sheet effectively absorbs unnecessary electromagnetic wave and controls noise. Advantages of the new product includes a UL94V-0 status (thickness of 0.1mm to 0.5mm), and heat resistance to as high as 130°C. According to SDK, this enables the sheet to cope with the heat buildup resulting from the use of high-frequency LSIs.

SDK has started sample shipments of the product, with plans to start full-scale sales by the end of the year. The company will also further develop thinner halogen-free sheets (0.05mm and 0.025mm) while maintaining their high noise-control and heat-resistance characteristics to meet the demand for more compact electronic devices.

Nat Insts & Agilent JV on LabVIEW

National Instruments and Agilent Technologies Inc have formed a joint initiative to create NI-certified LabVIEW instrument drivers for control of Agilent gas and liquid chromatographs. The plug-and-play drivers extend the analysis, automation and I/O integration capabilities of Agilent life science instruments, enhancing their application to custom scientific endeavors such as gas stream analysis in fuel-cell development and hydrocarbon processing.

SiC, gallium and Si bouquets



Stunning images taken by Ghim Wei Ho, a PhD student studying nanotechnology at Cambridge University. She has named some of her best photographs nanobouquet, nanotrees, and nanoflower because of their curious similarity to familiar organic structures such as flowerheads and tiny growing trees. Ghim Wei's work involves making new materials based on nanotechnology. The 'flowers' are an example. Here, nanometre scale wires of a silicon carbide are grown from tiny droplets of gallium on a silicon surface. The wires grow as a gas containing methane flows over the surface. The gas reacts at the surface of the droplets and condenses to form the wires. By changing the temperature and pressure of the growth process the wires can be controllably fused together in a natural process to form a range of new structures including these flower-like materials. Professor Mark Welland, head of Cambridge's Nanoscale Science Laboratory and Ghim Wei's supervisor, said: "The unique structures shown in these images will have a range of exciting applications. Two that are currently being explored are their use as water repellant coatings and as a base for a new type of solar cell."

Method tests molecular devices

Smaller electrical components enable smaller, faster computers and new devices like microscopic sensors. A long-term approach to finding ways to make electronic components smaller is to make them from single molecules. Made from molecules components are likely to be smaller than current chip fabrication methods, and can potentially self-assemble, making for inexpensive manufacturing processes.

Researchers from Purdue University have taken a step toward molecular components with a method for evaluating the room-temperature efficiency of transistors made from molecules. When electrical devices are scaled down to the dimensions of molecules, their behaviour often differs radically from their larger counterparts.

The researchers' method makes it possible to understand how a transistor may function and what its limitations are in order to figure out ways round those limitations.

The researchers' method provides a consistent way to evaluate the conductance of different mechanisms in molecular transistors. A single module can be used as the semiconductor channel in a field-effect transistor in three ways: using an electric field to change the molecule's conductance, which is how silicon transistors work; reversibly changing the molecule' s shape to break contact with electrodes; or changing the molecule's shape to alter its internal conductance. All of the approaches involve trade-offs.