Interview with Dr. Shuji Tsuruoka

ICON: Tell us a little about Mitsui and your multi-walled carbon nanotube product.

Shuji Tsuruoka: We currently produce a multi-walled carbon nanotube product known by the name MWNT-7. This product is produced as a dry powder and is very stable. The tubes do not aggregate together.

ICON: What do you think are the most promising applications of MWNT in the near future?

ST: There are many exciting potential applications of MWNT. Currently we are exploring them for use in anti-static clothing, to make electrically conducting ceramics, to strengthen lightweight metallic materials and improve the thermal conductivity of heat exchange materials. Due to the concerns about MWNT we have scaled back our commercialization of these materials while safety studies are being conducted.

ICON: Why are Mitsui products being studied for their toxic potential?

ST: Mitsui has provided free samples of our MWNT to researchers in government agencies and academic institutions in many countries for safety testing. We place no conditions on the researchers except to share their findings with us in advance of publication so that we can be prepared for public discussion. Our materials have become a benchmark for these studies and we are working closely with various federal agencies and universities to test them.

ICON: Concerns have been raised about MWNT potentially acting like a toxic form of asbestos. In your opinion is there any possibility that humans are at risk from developing diseases such as mesothelioma as a result of exposure to MWNT?

ST: The risk is very low. If the nanotubes can translocate from the lung to other parts of the body there may be a problem but the form in which they could be inhaled does not permit the nanotubes to move around the body. In addition we have to think about where the exposure might occur during the actual application of the product. Exposure is a critical issue and must be taken into account.

ICON: What steps has your company taken to ensure the safety of its workers?

ST: The process of making MWNT is completely closed for technical requirements. The most dangerous point of potential exposure by the worker is in the process of transferring the MWNT from the reactor “hopper” to the container bags. We have installed a ventilation system in this area. In addition we require employees to wear a mask, goggles, caps, long-sleeved shirts and long pants. The Japanese Environmental Institute has conducted a field study in our plant and found no MWNT in the air. They will return to repeat the test when the reactor is open for cleaning to see if that changes the results. We are producing documentation on safety practices to share with our customers so they know how to handle our materials safely.

ICON: Should consumers be concerned about being exposed to MWNT through normal use of products in which they are embedded?

ST: No, we have conducted skin sensitization studies on the anti-static fabrics and found no skin irritation or itchiness. And Mitsui’s MWNT have been demonstrated not to penetrate the skin.
Bio
Shuji Tsuruoka is Senior Staff of the Technology/Business Planning Division of Bussan Nanotech Research Institute, Inc. (Mitsui & Co. Ltd.) Prior to joining Bussan, he was General Manager of Research and Development Center of Fumakilla (Malaysia) Berhad-Penang, Malaysia. He received B.S and M.S. degrees in Applied Chemistry from Waseda University-Tokyo and a PhD in Chemical Engineering from the University of Arizona in the United States.