Argonne NATIONAL LABORATORY

# SOLVING A HOT PROBLEM WITH THE ADVANCED PHOTON SOURCE

*Aiding the Development of DuPont™ SUVA®*

**DuPont™ SUVA® is a reliable, proven, and safe alternative to CFCs, the most common air-conditioning refrigerant in the world, which is being phased out because of its damaging impact on the ozone layer.**

**Photo courtesy of DuPont™**

Synchrotron x-ray techniques and the extreme brightness of Advanced Photon Source (APS) x-rays were employed by DuPont ™ scientists using the DuPont-Northwestern-Dow Collaborative Access Team x-ray beamline at the APS at Argonne National Laboratory to characterize the metal oxide contents of candidate substitute catalysts, helping in the development of DuPont™ SUVA®, a reliable, proven, and safe hydrofluorocarbon (HFC) alternative to chlorofluorocarbons (CFCs). CDFCs are the most common air-conditioning refrigerant in the world, and are being phased out due to their damaging impact on the ozone layer. SUVA® has the potential for zero impact on ozone depletion while reducing energy consumption and waste products in the manufacturing process.

Researchers using synchrotron x-ray facilities, such as the U.S. Department of Energy (DOE) Office of Science's APS, are studying the underlying causes of adverse impacts on Earth's climate, and looking for solutions to those problems. The APS and other DOE x-ray light sources enable investigations in nearly every scientific discipline. They help researchers find ways of sequestering carbon away from the atmosphere, improve catalysts that could help eliminate harmful nitrogen-oxide emissions from diesel exhausts, enhance or develop the materials and chemical processes involved in myriad alternative energy sources, and create substitutes for useful, everyday substances that are known to adversely impact our environment.

One example are fluorocarbons, CFCs in particular, which can erode the ozone layer. Ozone-layer depletion has been shown to be a major cause of our atmosphere's rising temperature. Under the Montreal Protocol, an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion, CFCs were mandated to be replaced by hydrochlorofluorocarbons (HCFCs), which are "less bad" than CFCs, and HFCs, which are "not at all bad" from an ozone-depleting perspective.

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