TMS Partners with the Center for Resource Recovery and Recycling

The TMS Board of Directors signed a Memorandum of Understanding (MOU) in February to develop an array of ongoing cooperative activities with the Center for Resource Recovery and Recycling (CR³)—the first research center in the United States dedicated to developing new technologies for maximizing the recovery and recycling of metals used in manufactured products and structures. Worcester Polytechnic Institute (WPI) and Colorado School of Mines (Mines) recently established CR³ with a five-year, $400,000 award from the National Science Foundation (NSF). In addition, consortium member corporations are supporting the Center with an annual fee of $30,000. Estimated funding for CR³ is about $3 million over the next five years.

“TMS is pleased to announce the MOU with the NSF-supported Center for Resource Recovery and Recycling,” said George T. (Rusty) Gray III, 2010 TMS president. “This synergy between the two groups will serve as a strong partnership to facilitate a venue for CR³ to hold review meetings in conjunction with TMS’ Annual Meetings, as well as to promote CR³ workshops and training opportunities. In addition, this agreement reflects the selection of TMS as a preferred outlet for the dissemination of research results and other CR³ information to the broader materials community.”

“TMS is excited to be a partner with CR³ as our membership grows to deliver its programming and technical content by supporting the pivotal role of materials science and engineering in the areas of materials sustainability,” Gray continued. “Assisting industrial, academic, and educational efforts to foster the central role of materials in society is a central focus of TMS’ growing Materials and Society initiatives.”

In addition to the support it offers to CR³ review meetings, workshops, and training sessions, TMS will also enable information dissemination and demonstration of CR³ educational tools through TMS Webcasts, facilitate publication opportunities for CR³ results through TMS publications, including JOM and Metallurgical and Materials Transactions, and promote and provide access to CR³ educational software tools through the TMS Web portal.

The connection between TMS and CR³ actually runs even deeper than their shared dedication to enhancing awareness and application of materials sustainability practices. Diran Apelian, Howmet Professor of Mechanical Engineering and director of the Metal Processing Institute at WPI, as well as TMS 2008 president, will serve as CR³’s director, with WPI as the lead institution. Brajendra Mishra, Mines professor, associate director of the Advanced Coatings and Surface Engineering Laboratory and the Kroll Institute for Extractive Metallurgy, and TMS 2006 president, will serve as associate director.

“If you think about where we came from, where our passions have been, and how our volunteer efforts are directed, both Brajendra’s presidency and mine were very much directed to materials and society,” said Apelian. “Both of us have had a record of commitment to sustainability, to our profession’s responsibility to the world, and to the planet Earth. This opportunity to establish the nation’s first materials resource recovery and recycling center is not accidental.”

Faculty and students associated with CR³ will collaborate with industry partners to conduct research focused on innovative recovery and recycling processing technologies that maximize the capture and reuse of post-consumer scrap and minimize the production of manufacturing scrap. CR³ efforts will include designing metallic alloys that meet performance standards while increasing recyclability; developing sensors and sorting technologies that more effectively identify metals and separate them from the waste stream; and establishing materials sensors, processes, and controls to achieve greater tolerance of scrap metal input for downstream recycling processes.

CR³ will be co-located at both universities, with WPI focusing on metallic materials for structural applications, and Mines concentrating on metals used in functional applications, including high-value and rare-earth metals used in computers, electronics, and photovoltaics.

The NSF award will fund the cost of establishing CR³ and recruiting between 30 to 40 corporate members, which may include scrap yards, disassembling companies, municipal waste centers, shredding companies, smelters, foundries, and manufacturers. CR³ members will be able to help determine the direction of and benefit from CR³’s precompetitive research, have royalty-free rights to intellectual property resulting from that research, and have the option of sponsoring supplementary research projects for additional fees. “We now have 14 companies that have committed $30,000 a year in funding, and another six or seven that have shown interest to join in,” said Apelian.

“Industry has really accepted this enthusiastically,” Mishra agreed. “There is a definite need for this. We make things out of natural resources and, sooner or later, those natural resources are going to run out.”

“Materials are not renewable,” Apelian added.

“The key to any resource recovery solution,” said Mishra, “is that it does not consume more energy than producing new materials. It’s only going to work if it saves energy, saves on costs, and saves on resources.”

A Clean Sweep: New Photocatalyst Beats Bacteria

An enhanced photocatalytic disinfection process that uses visible light to destroy harmful bacteria and viruses—even after the light is switched off—has been developed by researchers at the University of Illinois (U of I).