PROCESS TECHNOLOGY

A Cooler Way to Make Olefins

Quantiam Technologies, Inc. (Edmonton, Alberta, Canada; www.quantiam.com) has been awarded $1.45 million from Sustainable Development Technology Canada (SDTC; Ottawa, Canada; www.sdtc.ca) as part of a consortium developing a catalytic surface coating and application technique for furnace coils used inside olefins furnaces. The innovation is said to effect a 20% reduction in the cracking (pyrolysis) process' greenhouse gas emissions. Energy costs, which, for olefins production, exceed $10 billion/yr, are also cut by 20%.

Quantiam is now building a pilot manufacturing plant to produce sufficient prototypes for commercial field trials. These prototypes are furnace coils fabricated from basic components (tubes and fittings) that have been coated using the new technology, and that can be installed in commercial furnaces for trials. The firm projects that the coatings will be ready for the marketplace by 2007.

The formulation is described as a composite made of nanoscale ceramic and metallic constituents – the latter of which potentially provides a 5O – 100'C reduction in operating temperature (typically 1,100^{o}C). "Competitors in the U.S., Europe and Asia are developing fully-catalytic olefins manufacturing processes aimed at lowering temperatures by 200-400^{o}C," notes Steve Petrone, the company's president. "But such processes will require new furnace designs and are at least 10-20 years away. In contrast, the consortium's technology can be retrofitted to existing furnaces, providing a viable near-term solution," he continues.

Quantiam plans to manufacture the catalysts and coated parts, shipping the finished product directly to customers when they are scheduled to replace their furnace coils (typically every 4-5 years). The company has also secured $8.3 million from other private and public sources, including NOVA Chemicals Corp., a leading olefins producer.

"The objectives of the coating process are to achieve optimal catalyst surface coverage and overall coating microstructure as there is a potential to over-catalyze," says Petrone. The coating must also withstand extreme service temperatures, resist corrosion due to materials such as sulfur, sodium and chloride and also be compatible with the feedstock type. The consortium is developing several coatings for the range of feedstocks used by the industry that include ethane, propane, butane and naphtha. "Some coatings will be field tested by the end of 2006," Petrone notes. Although he would not comment on the coatings' compositions and application method, Petrone pointed out that expensive materials such as precious metals are not used in the catalyst formulations. "The application technology is the first of its kind, and does not involve vapor or thermal spray depositions. End-use of the technology is not expected to be capital intensive and will have an attractive benefit to-cost ratio," he concludes.