

Media Release

Clariant signs agreement with RTI International to supply unique sorbent for warm gas desulfurization technology

- **Warm Gas Desulfurization Process used for cleaner energy and chemicals from high-sulfur feedstocks**
- **Unique sorbent material supplied by Clariant key to operations at elevated temperatures**
- **Quick-reacting sorbent has high sulfur adsorbance enabling treatment of large gas streams**

Munich, November 14, 2017 – Clariant, a world leader in specialty chemicals, today announced the signing of a global licensing agreement with RTI International granting Clariant exclusive rights of supply for their solid sorbent material which is vital for RTI's warm gas desulfurization process (WDP) technology.

WDP is an advanced market-ready technology for producing cleaner energy and chemicals from coal and other high-sulfur feedstocks. It enables sulfur-containing gas streams, such as synthesis gas (or syngas) from coal or petcoke gasification, to be cleaned at elevated temperatures (250-650°C), thus reducing or eliminating the need for substantial gas cooling and expensive heat recovery. This increases overall process efficiency, reduces greenhouse gas emissions, and reduces the capital and operating costs of the entire gas cleanup block by up to 50 percent compared to conventional technologies.

A solid fluidizable sorbent to be supplied by Clariant is key to the WDP technology due to its unique characteristics. Able to function across a wide range of operating temperatures and pressures, the quick-reacting sorbent has a high capacity for adsorbing sulfur, removing H₂S and COS to very low levels and allowing customers to treat large gas streams volumes. The sorbent is regenerable with a low attrition rate and long cycle lengths without major replacement requirements, thus reducing the need for shut-downs. It will be a key addition to Clariant's other extensive and highly proficient adsorbents and syngas conversion products. The enhanced sorbent will provide truly integrated solutions to meet the increasingly stringent requirements of the industry.

“Clariant has always played a pioneering role in advanced material development for process improvement,” said Stefan Heuser, Senior Vice President & General Manager Business Unit Catalysts at Clariant. “We are delighted to be appointed as the exclusive supplier of this important sorbent for RTI's warm gas desulfurization technology. A partnership with such an eminent organization only validates further Clariant's commitment to excellence and innovation.”

WDP technology uses a novel transport reactor design and this unique high capacity, regenerable, attrition-resistant solid sorbent with excellent performance. The technology can achieve up to 99.9 percent removal of total sulfur from syngas at temperatures as high as 650°C and over a wide range of sulfur concentrations. The process was demonstrated, with funding support from the U.S. Department of Energy, on a 54,000 Nm³/h synthesis gas stream in a coal/petcoke gasification plant at Tampa Electric's Polk Power Station in Florida, where it operated successfully for more than 3,500 hours.

The integration of this technology with a downstream activated-amine carbon capture process enabled further reduction of total sulfur in the syngas to sub-ppmv concentrations (as low as 100 parts per billion), suitable for stringent synthesis gas applications such as chemicals, fertilizers, and fuels.

Clariant is a leading supplier of catalysts and sorbents used in the synthesis gas, or syngas, process industry, with a long history of innovation and expertise in the field. Clariant has already produced more than 100 tons of sorbent in commercial-scale equipment for use in RTI's scale-up and near-commercial demonstration testing of the WDP technology.

"We are very excited to have Clariant as the supplier of our WDP solid sorbent," said Raghubir Gupta, Ph.D., Senior Vice President, Energy Technology Division at RTI. "Cooperation with a well-respected, innovative and reliable catalyst partner is essential for RTI's new process development. Our relationship with Clariant spans several decades (including their predecessor companies Süd-Chemie and United Catalysts), and they have been a reliable supplier for all of the sorbent and catalyst materials used in the successful scale-up and demonstration of our WDP technology."



WDP is an advanced technology for producing cleaner energy and chemicals from coal and other high-sulfur feedstocks by enabling sulfur-containing gas streams to be cleaned at elevated temperatures. (Photo: RTI)



A solid fluidized sorbent to be supplied by Clariant is key to the WDP technology due to its unique characteristics. (Photo: RTI)

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Clariant is a globally leading specialty chemicals company, based in Muttenz near Basel/Switzerland. On 31 December 2016 the company employed a total workforce of 17 442. In the financial year 2016, Clariant recorded sales of CHF 5.847 billion for its continuing businesses. The company reports in four business areas: Care Chemicals, Catalysis, Natural Resources, and Plastics & Coatings. Clariant's corporate strategy is based on five pillars: focus on innovation through R&D, add value with sustainability, reposition portfolio, intensify growth, and increase profitability.

www.clariant.com/catalysts

Clariant's Catalysts business unit is a leading global developer and producer of catalysts for industrial processes. It has been part of the Catalysis business area of the Clariant Group since the acquisition of Süd-Chemie in 2011. Clariant Catalysts is headquartered in Munich, Germany, and has a total of 16 production sites, 15 sales offices, and 11 R&D and technical centers around the world. Approximately 1 550 employees serve customers across all regional markets. Aimed at delivering sustainable value to customers, Clariant's catalysts and adsorbents are designed to increase production throughput, lower energy consumption, and reduce hazardous emissions from industrial processes. The broad portfolio also includes products that enable the use of alternative feedstock for chemical and fuel production.

www.rti.org

RTI International is an independent, nonprofit research institute dedicated to improving the human condition. Clients rely on RTI to answer questions that demand an objective and multidisciplinary approach—one that integrates expertise across the social and laboratory sciences, engineering, and international development. RTI believes in the promise of science, and RTI staff are inspired every day to deliver on that promise for the good of people, communities, and businesses around the world. For more information, visit www.rti.org.

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