

## Press release

2016/10/20

### **Good news for the climate: Highly efficient catalysts from Heraeus reduce dangerous nitrous oxide greenhouse gas emissions by 95%**

#### **Paris Climate Agreement ratified: Reducing nitrous oxide contributes to reaching climate goals – Fertilizer production without the greenhouse gas now possible thanks to innovative catalyst systems**

Europe, the US and China were among those ratifying the historic Paris agreement, which will go into effect at the beginning of November. The agreement aims to help keep the earth's temperature from rising more than 2°C. The Nitric Acid Climate Action Group, formed in December 2015 at the global climate summit, will also work hard to meet climate targets. As part of its efforts, the Group will focus on reducing climate-altering nitrous oxide emissions from fertilizer production and in the chemical industry by 2020. Now, highly efficient catalysts from Heraeus can reduce nitrous oxide emissions by up to 95%. Heraeus is installing this reduction technology in existing nitric acid plants around the world. "Each retrofitted plant brings us one step closer to sustainable climate and environmental protection and will help us reach the climate targets agreed on at the 2015 Paris summit," says Jörg Eckert, sales manager for Process Catalysts at Heraeus.

When basic chemicals for fertilizers, such as nitric acid, are produced, the process releases nitrous oxide into the atmosphere as a byproduct. This greenhouse gas has 310 times the global warming potential of carbon dioxide (according to the Kyoto Protocol, based on 100 years) and is thereby a major factor in global warming. More than 60 million tons of nitric acid are produced around the world annually, with an estimated 500,000 tons of nitrous oxide generated as a byproduct – equivalent to the carbon dioxide emissions from over 60 million mid-sized cars.

#### **Climate protection starts with nitric acid production**

Nitric acid is produced as a basic component in nitrate fertilizers using a process called ammonia oxidation (Ostwald process). Ammonia and air are routed over platinum gauzes heated to 900°C, producing nitrogen oxide that bonds with water to create nitric acid. This chemical reaction requires up to six meters of round gauzes made from platinum alloys. Heraeus has been a leading producer of these precious metal catalysts worldwide for more than 100 years. During the ammonia oxidation process, nitrous oxide emerges in a secondary reaction. Heraeus' patented FTC<sup>1</sup> gauze systems are already reducing nitrous oxide emissions by up to 50%. However, a special catalyst system installed downstream can further reduce emissions by up to 95%. Heraeus offers these precious and non-precious metal catalysts to achieve these reductions. "Precious metal catalysts offer immense benefits when retrofitting plants. For example, they require less space, are highly efficient and have longer service lives. The catalyst is installed in the nitric acid reactors directly below the existing catalytic gauzes," explains Eckert. The nitrous oxide molecules pass through the granulate-like catalyst and are, with a few exceptions, destroyed – turning into nitrogen and hydrogen.

<sup>1</sup> FTC = Functional Total Control

## **Customized full service retrofitting worldwide by Heraeus**

The system can be adapted to specific customer requirements and allows existing reactors to be retrofitted at a reasonable cost. Heraeus has been installing this innovative system solution into existing nitric acid plants since 2006. "Plant operators benefit from our full service as a solution provider. Technical service teams for customers in America, Europe, Africa and Asia are available to customize this gauze and catalyst system solution, install it on site and check the process parameters while in operation," explains Jörg Eckert.

The demand for retrofitting nitric acid plants will certainly rise with the increasingly tougher legal requirements for reducing nitrous oxide emissions in the coming years. By 2020, the target year set by the Nitric Acid Climate Action Group, all nitric acid plants should be equipped with nitrous oxide reduction technology. Developing countries, in which the relevant technologies are often not yet available, will benefit particularly from this initiative. The Heraeus catalyst system thus offers a suitable, well-established system solution for reducing nitrous oxide emissions to under emission limits. This means the world may soon be able to breathe a bit easier.

**Heraeus**, the technology group headquartered in Hanau, Germany, is a leading international family-owned company formed in 1851. With expertise, a focus on innovations, operational excellence and an entrepreneurial leadership, we strive to continuously improve our business performance. We create high-quality solutions for our clients and strengthen their competitiveness in the long term by combining material expertise with technological know-how. Our ideas are focused on themes such as the environment, energy, health, mobility and industrial applications. Our portfolio ranges from components to coordinated material systems which are used in a wide variety of industries, including the steel, electronics, chemical, automotive and telecommunications industries. In the 2015 financial year, Heraeus generated revenues without precious metals of €1.9 bn and a total revenue of €12.9 bn. With approximately 12,500 employees worldwide in more than 100 subsidiaries in 38 countries, Heraeus holds a leading position in its global markets.

## **For additional information, please contact:**

Dr. Jörg Wetterau  
Communications & Marketing  
Head of Technology Communications & Trade Press  
Heraeus Holding GmbH  
Heraeusstraße 12-14  
63450 Hanau  
Phone +49 (0) 6181.35-5706  
E-mail: [joerg.wetterau@heraeus.com](mailto:joerg.wetterau@heraeus.com)  
[www.heraeus.com](http://www.heraeus.com)