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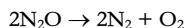


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## Nitrous Oxide Greenhouse Gas Abatement Catalyst

Among the naturally occurring greenhouse gases, nitrous oxide (N<sub>2</sub>O) is estimated to absorb 310 times (1, 2) more heat per molecule than carbon dioxide, thus contributing substantially to global warming (3). Atmospheric N<sub>2</sub>O is estimated to have increased by ~ 16% since the Industrial Revolution, and has contributed 6 to 11% to enhancing the greenhouse effect. Up to 40% of total atmospheric N<sub>2</sub>O is estimated to be man-made – equivalent to ~ 15 million tonnes per year (4). N<sub>2</sub>O is gradually accumulating in the atmosphere (2), despite slow breakdown by sunlight.

To reduce the production/emission of N<sub>2</sub>O as a waste product from nitric acid plants, the Norwegian nitrogen fertiliser manufacturer Yara International ASA (5) has developed a N<sub>2</sub>O abatement catalyst based on the reaction:



The de-N<sub>2</sub>O catalyst, which can cope with the high temperatures and corrosive environment of a nitric acid plant, is placed under the rhodium-platinum gauze pack and the catchment gauzes (6). It enables the N<sub>2</sub>O output in most plants to be reduced by 80% or more. The catalyst is of pelleted configuration, and when used with the Pt-Rh catalyst system gives an environmentally enhanced process with highly efficient N<sub>2</sub>O abatement. The catalyst is installed in several nitric acid plants, and more are planned.

Johnson Matthey, as a catalyst gauze supplier, will market the catalyst to 'clean development mechanism' (CDM) and 'joint implementation' (JI) countries as defined by the Kyoto Protocol. N<sub>2</sub>O emission reductions can thus be brought into line with requirements sought by the Kyoto Protocol (7). T. KOPPERUD

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