nitric acid plant. The power evolved per unit length of heating element versus the number of gauzes in the catalyst pack is shown in Figure 5, while the power versus linear velocity of the AAM is shown in Figure 6.

## Conclusions

The experience gained from implementing commercial EID has produced data which have been used for the design of devices for ammonia conversion reactors working under a wide range of technical parameters. The structure of the catalyst gauze, its size and geometric design are now taken into consideration when simulating an ammonia oxidation reaction spreading over the whole surface. Technical characteristics of the ammonia oxidation process, gauze composition and geometric characteristics of the platinum alloy gauze are also taken into account.

As a result of this research, it may be expected that this new, simple, explosion-free technique for starting-up ammonia oxidation reactors to produce nitric acid, prussic acid and hydroxylamine sulfate will find wide application in the near future.

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## Ammonia Reactions on Ruthenium

Studying ammonia ($NH_3$) decomposition helps in understanding the kinetics of $NH_3$ synthesis and contributes towards cleaning up $NH_3$ emissions from sewage and activated sludge. For nearly a century iron catalysts have been used to synthesise $NH_3$ from hydrogen ($H_2$) and nitrogen ($N_2$). However, ruthenium (Ru) materials are now replacing them. The major drawback of Ru catalysts is $H_2$ poisoning, as $H_2$ retards the dissociative adsorption of $N_2$, which is the rate determining step in $NH_3$ synthesis. As cerium oxide ($CeO_2$) can stabilise noble metal dispersion and improve $H_2$ poisoning, it has been used as a catalytic support to promote $N_2$ activation or $NH_3$ synthesis.

Scientists from Osaka Municipal Technical Research Institute, Japan, have now used Ru and $CeO_2$ to prepare a catalyst which decomposes $NH_3$ with high activity (K. Hashimoto and N. Toukai, *J. Mol. Catal. A: Chem.*, 2000, **161**, (1–2), 171–178). The catalyst consists of Ru-$CeO_2$ highly dispersed in Y-form zeolite (YZ). Ru-$CeO_2$/YZ works at conditions where YZ and $CeO_2$ are inactive.

The catalyst contained (in wt.%): 64.0 $SiO_2$, 19.5 $Al_2O_3$, 10.2 $CeO_2$ and 1.9 Ru. The decomposition rate was first order in $NH_3$. The Ru particles loaded on $CeO_2$/YZ reduce inhibition of the decomposition rate by $H_2$.

IR spectra for the catalyst showed that $NH_3$ decomposition at 300°C proceeded via formation of intermediate species, such as Ru–$NH_3$, Ru–$NH_2$, Ru–$N_2$ and Ru–H on the Ru surface.

## Glass Conference in Veliky Novgorod

On 4th to 8th June 2001, the first international conference on 'Markets of Glass Fiber Materials, High-Quality Glasses, Monocrystals and Precious-Metal Equipment for Their Production' is to be held in Veliky Novgorod, Russia. Other topics likely to be discussed include the science and technology of glass and glass fibre, production and applications, manufacture of silicate products and the use of platinum metals equipment. The working languages will be Russian and English.

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