# NH3 Slip Catalyst for Clean Air Technology

**A binary catalyst that oxidizes NH3 into either N2 or NO and reduces the NO with NH3 to form N2.**

**Category**
Cleantech

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## Background

Selective catalytic oxidation (SCO) of NH3 to N2 is one of the best ways to eliminate NH3 emissions. The major challenge in NH3-SCO is to achieve high conversion over a wide operating temperature range, while avoiding over-oxidation to NOx. Commercial Pt catalysts have full NH3 conversion at low temperatures but suffer from low N2 selectivity. Its low temperature performance needs to be improved to meet the upcoming EU7 emission standards.

## Technology Overview

The researchers have designed a binary catalyst that shows better performance than the commercial ones. The Pt component is used to oxidize NH3 into either N2 or NO. The CuO component will then reduce the NO with NH3 to form N2 as the inert product. With only 0.6 wt% Pt atoms dispersed on the surface of Cu nanoparticles, simultaneously high conversion and selectivity are achieved over a wide temperature window.

The catalysts preparation is based on standard precipitation and galvanic exchange procedure, which can be easily scale up. In the next stage, the researchers will:

1. Evaluate the catalysts under realistic NH3 slip conditions and test the on stream stability

2. Scaling up the production of the catalysts to kg level by collaborating with industrial partners

3. Deliver prototypes of catalyst bed for NH3 emission control

See Figure 1.

## Benefits

• The PtCu/Al2O3 catalyst can shift the NH3 conversion by 50 K to the low temperature region

• The catalyst has >95% N2 selectivity even at full NH3 conversions, significantly surpass that of the commercial ones

• The catalyst only has half of the Pt content to that of the commercial ones

• The synthetic procedure is easy to scale up

## Applications

• Car emission control: for vehicles that use diesel engines and SCR technologies

• NH3 emission control in chemical industry

## Opportunity

• Partners that can help with the long term stability test of the catalyst under realistic conditions

• Partners that can help in scaling up the production of the catalysts

• Partners that are potential users of the catalysts

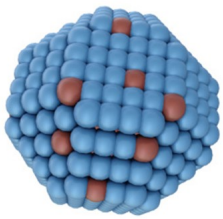
## Seeking

Development partner,

Commercial partner

## IP Status

Patent application submitted



$Pt_sCuO$