



招聘信息:

新闻中心

环科新闻

图片新闻

当前位置: [首页](#) >> [新闻中心](#) >> [图片新闻](#)

C&EN和GCC专题报道环境系控制PM2.5的脱硝技术

发表时间: 2015-12-30 阅读次数: 2799次

美国化工新闻杂志Chemical & Engineering News (C&EN) 和环保汽车会Green Car Congress (GCC) 报道了复旦大学环境系唐幸福课题组研发的脱硝技术。这项技术可以有效地控制PM_{2.5}前体物NO的排放, 对减少大气PM_{2.5}污染物有积极重要的作用。

C&EN以题为“Catalyst Helps Control NO_x Emissions”对这项脱硝技术进行了专题报道。SCR是控制NO最重要的技术, 核心是催化剂。碱金属和SO₂是SCR催化剂两种最重要的毒物, 在固定源烟气和移动源尾气中均大量存在。无论是传统的还是新研发的SCR催化剂都不能同时抗碱金属和抗SO₂中毒, 导致催化剂的使用寿命缩短。

唐幸福课题组于2015年初建立了本征的碱金属中毒机理 (*Environ. Sci. Technol.* 2015, 49, 7042–7047), 随后开发出同时抗碱金属和抗SO₂的脱硝技术 (*Environ. Sci. Technol.* 2015, 49, 14460–14465)。研究表明: 在同时存在高浓度的碱金属和SO₂的环境下, 新型脱硝催化剂表现出良好的SCR催化性能, 而传统的催化剂则完全失活。这项脱硝技术提供了一种新型的SCR催化剂, 具有强的抗碱(土)金属和抗SO₂中毒能力, 可广泛应用于火电厂、重工业、汽车等源头的氮氧化物排放控制。

C&EN Serving The Chemical, Life Sciences & Laboratory Worlds
CHEMICAL & ENGINEERING NEWS

Catalyst Helps Control NO_x Emissions And Resists Contamination

A new study describes a catalyst that reduces nitrogen oxide emissions while resisting poisoning by sulfur and alkali metals (*Environ. Sci. Technol.* 2015, DOI: 10.1021/acs.est.5b03972). It is already being used to clean the emissions at two industrial plants in China, the researchers say.

Combustion—whether from power plants, vehicles, or factories—produces nitrogen oxides (NO_x), health-harming gases that also generate ozone and particle pollution. Power plants remove NO_x by reacting the exhaust gas with ammonia to produce nitrogen and water. However, the catalysts used for this selective catalytic reduction can be poisoned by other components of the exhaust, like alkali metals and sulfur dioxide, which render the catalysts ineffective.

Sulfur dioxide adsorbs onto the surface of the catalyst and reacts to form sulfates that block its active sites. Catalysts made of metal oxides with protonated hydroxyls on their surface, like vanadium oxide, resist sulfur deposition. However, this surface also makes it easier for alkali ions in the exhaust, such as potassium, that come from the fuel burned

ALKALI TRAP
A structural model shows tungsten oxide units (gray forming hexagonal nanorods with tunnels that can hold potassium ions (purple)).
Credit: Yinglu Tang

Green Car Congress
Energy, technologies, issues and policies for sustainable mobility

29 December 2015 Home Topics Archives About Contact RSS Twitter Headlines

Researchers develop alkali- and sulfur-resistant tungsten-based catalysts for SCR NO_x control
7 December 2015

Researchers at Fudan University, with colleagues at the University of Jinan and Chongqing University, have developed alkali- and sulfur-resistant tungsten-based catalysts for SCR NO_x emissions control. A paper on their work is published in the ACS journal *Environmental Science & Technology*.

Alkali metals and sulfur oxides are two kinds of the well-known poisons of catalysts used in the selective catalytic reduction (SCR) of NO_x with NH₃ from both stationary and mobile sources. At the 2015 AIChE Annual Meeting in Houston last month, Yasser Jangjou and William Epling presented a paper on sulfur poisoning of the SCR reaction, noting that sulfur is a common automotive catalyst poison even for the newer metal-exchanged small pore zeolite selective catalytic reduction (SCR) catalysts.

C&EN: <http://cen.acs.org/articles/93/web/2015/12/Catalyst-Helps-Control-NOx-Emissions.html>

GCC: <http://www.greencarcongress.com/2015/12/20151207-scr.html>