Supplementary information

Table S1 lists the main review articles of recent years and their subsidiary information (the year up to which literature is covered, topic reviewed and refs), illustrating the complementary work and necessity of this review.

Table S1. Summary of existing key review articles and supplementary work of this review

Number	Key review articles	Subject reviewed	Article information	Year up literature cove	Necessary supplement to our paper
1	Advances in direct NOx decomposition catalysts	The research progress of three catalysts for catalytic decomposition of NO are reviewed, including Cu-ZSM-5, perovskite-type and rare earth oxides, with a few summaries on the mechanism, and the tolerance of the catalyst in the coexistence of reactant gases O_2 and CO_2 is concerned.	Applied Catalysis A: General (2012)	Majority of the literatures involved are concentrated before 2000, and the minority are concentrated in 2000-2010.	The detailed data of NO emissions in China has been supplemented, the comparison of various de-NO_x methods has been added, the research progress of other three types of catalysts for NO decomposition has been added, which include precious metals, hydrotalcite, and heteropoly acids, and both experiments and mechanism
2	A review on the catalytic	The research progress of three catalysts for catalytic decomposition	Catalysis Science & Technology	Majority of the literatures	

	decomposition of NO to N_2 and O_2: catalysts and processes	of NO are reviewed, including metal oxide catalysts, supported metal oxide catalysts and Cu-ZSM-5, and the tolerance performance of them in coexisting reaction gases (including O_2, H_2O, and CO_2) are compared.	(2018)	involved are concentrated in 2000-2010.	research on NO decomposition by Cu-ZSM-5 has been summarized in detail.
3	Recent Advances on Nitrous Oxide (N_2O) Decomposition over NonNoble-Metal Oxide Catalysts: Catalytic Performance, Mechanistic Considerations, and Surface Chemistry Aspects	The research progress on the decomposition of N_2O with non-noble metal oxide catalysts since 2000 is reviewed. Including: pure oxide, hexaaluminate, hydrotalcite, spinel, perovskite, etc. The reaction mechanism, relationship between structure and activity, the role of various inhibitors (such as O_2, NO, H_2O) and the strategies for adjusting the local surface structure of MOs	ACS Catalysis (2015)	Majority of the literatures involved are concentrated in 2000-2014, and the minority are concentrated before 2000.	Some papers reported that N_2O is an intermediate product in the decomposition of NO by catalysts such as Cu-ZSM-5, and some catalysts that are active in the decomposition of N_2O are also effective for the decomposition of NO. The summary of this paper also benefits the research on N_2O decomposition.

		are reviewed.			
4	Selective Transformation of Various Nitrogen-Containing Exhaust Gases toward N_2 over Zeolite Catalysts	The research progress on the conversion of nitrogen-containing exhaust gas (HCN, CH_3CN, C_2H_3CN, N_2O, NO) to N_2 on zeolite catalysts is reviewed, and the physical and chemical properties of zeolite are introduced. For the removal of NO, two methods include catalytic reduction and catalytic decomposition are introduced.。	Chemical Reviews (2016)	There are totally 335 references and concentrated in 2000-2015.	In addition to catalytic reduction and catalytic decomposition, other de-NO_x methods such as adsorption, storage reduction and selective non-catalytic reduction are supplemented. The types of catalysts used for the catalytic decomposition of NO have been expanded, and Cu-ZSM-5 is further introduced.
5	Local Environment and Nature of Cu Active Sites in Zeolite-Based Catalysts for the Selective Catalytic	The local environment of the key information copper species in the copper-based zeolite catalyst in the mobile source NH_3-SCR technology is reviewed. Including Y, ZSM-5,	ACS Catalysis (2013)	The literature involved ranging from 1990 to 2012.	The local environment and conversion mechanism of the copper species in Cu-ZSM-5 are the key and difficult points to study the mechanism of its

	Reduction of NOx	SSZ-13. The experiment and characterization methods used to study metal-containing zeolite catalysts are introduced.			catalytic reduction and catalytic decomposition of NO, and a review article studying this topic in the catalytic decomposition reaction has not appeared yet. The fourth part of our paper focuses on this content.
6	Cerium Oxide-Based Catalysts for Low-Temperature Selective Catalytic Reduction of NOx with NH_3: A Review	E-R and L-H mechanisms of low-temperature NH_3-SCR method are introduced, and the research progress of three Ce-based catalysts (single CeOx, multimetal oxides and multimetal oxides with support) in SCR reactions are reviewed.	Energy & Fuels (2021)	Majority of the literatures involved are concentrated in 2010-2020.	SCR technology is the most mature de-NO_x method for pollutant control in industrial boilers and diesel engines, and vanadium-based oxides and CHA zeolite catalysts have also been successfully applied in commercial applications.
7	Selective Catalytic Reduction of NOx	The NH_3-SCR reaction and anti-poisoning mechanism are described,	Chemical Reviews (2019)	There are totally 589	However, considering other

	with NH_3 by Using Novel Catalysts: State of the Art and Future Prospects	and the research progress of new SCR catalysts are reviewed, including VOx, MnOx, CeO_2, Fe_2O_3, CuO, acidic compound catalysts containing vanadate, phosphate and sulfate catalysts, and ion exchanged zeolite catalysts such as Fe, Cu, Mn, etc.		references and the majority concentrated in 2000-2019, the minority existed before 2000.	sources of NO production and the drawbacks of SCR itself, it is necessary to introduce and develop other de-NO_x methods, this work has not been reviewed and reported yet.
8	Recent Progress and Future Challenges in Selective Catalytic Reduction of NO by H_2 in the Presence of O_2	The mechanism of the H_2-SCR reaction is reviewed, the influence and effect of the catalyst on the reaction activity are reviewed, and the influence of exhaust gas components on the reaction is focused from a practical point of view.	Industrial & Engineering Chemistry Research (2019)	Majority of the literatures involved are concentrated in 2000-2019.	
9	A Perspective on the	The research progress of commercial	ACS Catalysis	It's a huge time	The industry in this review

	Selective Catalytic Reduction (SCR) of NO with NH_3 by Supported V_2O_5-WO_3/TiO_2 Catalysts	V_2O_5 WO_3/TiO_2 catalyst of NH_3-SCR technology in industrial boiler is introduced. The perspective includes molecular structures of titaniasupported vanadium and tungsten oxide species, surface acidity, catalytic active sites, surface reaction intermediates, reaction mechanism and reaction kinetics.	(2018)	span, literatures before 2000 accounted for a large proportion.	only includes industrial boilers, and the catalyst is only for V_2O_5 WO_3/TiO_2. We hope to cover as many de-NOx methods and catalyst types as possible to improve the scientificity and comprehensiveness of our review and provide a reference for readers who are initially studying in this field.
10	Review of recent after-treatment technologies for DE-NOx process in diesel engines	Four mostly representative catalytic treatment technologies for diesel vehicles are reviewed, including LNT+SCR, Urea/NH_3-SCR, HC-SCR, and CO/H_2-SCR. The focus is the progress of the mechanism and	International Journal of Automotive Technology (2020)	Literatures involved ranging from 1990 to 2020.	The de-NO_x conditions for diesel vehicles differs significantly from that of industrial boilers, and catalytic decomposition method is worth considering in the field of

		the challenges it faces, and the activity, hydrothermal stability and anti-poisoning performance are also summarized.			diesel vehicle de-NO_x. Zeolite catalysts are commonly used catalysts in SCR technology of diesel vehicle, and the state of copper species in the Cu-ZSM-5 catalyst is summarized which also conducive to clarifying the mechanism of Cu-ZSM-5 in the SCR reaction.
11	Catalytic NOx Abatement Systems for Mobile Sources: From Three-Way to Lean Burn After-Treatment Technologies	The research progress and ideas of three-way, SCR and NSR de-NO_x methods are reviewed, and the impact on SCR when using biodiesel and synthetic Gas-to liquid as fuel are also summarized.	Chemical Reviews (2011)	There are totally 542 references and the majority concentrated in 2000-2010, the minority existed before 2000.	

12	SOx/NOx Removal from Flue Gas Streams by Solid Adsorbents: A Review of Current Challenges and Future Directions	The removing of SOx/NOx in flue gas by adsorption is reviewed, and the characteristics of solid adsorbent materials are discussed, as well as their applications in traditional and emerging acid gas removal technologies.	Energy&Fuels (2015)	Majority of the literatures involved are concentrated in 2000-2014, and the minority are concentrated before 2000.	The adsorption method is only one of many denitrification methods, and since the application background of this article review is power station, the introduction of liquid absorption method is not carried out. We reviewed the research progress of adsorption method including solid and liquid comprehensively, and introduced new developments in recent years, such as adsorption method and technology combining catalytic reduction and catalytic oxidation.