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In-situ DRIFTS investigation on the selective catalytic reduction of NO with NH₃ over the sintered ore catalyst

Wangsheng Chen¹, Ze Li¹, Fali Hu¹, Linbo Qin¹, Jun Han^{*1,2}, Gaoming Wu³

¹Hubei Key Laboratory for Efficient Utilization and Agglomeration of Metallurgic
Mineral Resources, Wuhan University of Science and Technology, Wuhan, 430081,
P.R. China

²Industrial Safety Engineering Technology Research Center of Hubei Province,
Wuhan University of Science and Technology, Wuhan, 430081, P.R. China

³ Wuhan Branch of Baosteel Central Research Institute, Wuhan Iron & Steel Co., Ltd,
Wuhan 430080, China

Abstract: In this study, the sintered ore used as catalysts for the selective catalytic reduction (SCR) of NO_x with NH₃ from the sintering flue gas was investigated. The experimental results demonstrated that the maximum denitration efficiency, about 61.64%, occurred at 300°C, 1.0 NH₃/NO ratio, and 1000 h⁻¹ gas hourly space velocity (GHSV). In order to understand the SCR denitration mechanism, the catalyst was characterized by DRIFTS, XPS, H₂-TPR, BET and ICP-MS. It was found that there were Lewis and Brønsted acid sites at the surface of the sintered ore, which lead to the appearance of amide species (-NH₂), NH₄⁺ intermediates, gaseous or weakly adsorbed NO₂ and nitrite species. Hence, it was concluded that the reaction of the amide species

*Corresponding author.
E-mail: hanjun@wust.edu.cn (J. Han)

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