

A study on the low temperature SCR activity enhancement with the addition of tungsten of Mn-Ce-Ti catalyst

김동호, 권동욱¹, 홍성창^{1,†}, 남기복¹, 최상현², 박광희²,
김기왕²

경기대; ¹경기대 환경에너지공학과;

²(주)에코프로

(schong@kgu.ac.kr[†])

This study is performed on the reaction characteristics of the selective catalytic reduction (SCR) using ammonia for a removal of nitrogen oxides (NO_x). Mn-Ce-W-Ti catalysts were prepared by a wet impregnation method. Tungsten loadings of catalysts were 0-10 wt.%. The SCR activity is increased to the maximum when it included 5 wt.% tungsten. But it showed a tendency to decrease when tungsten added more than that. The properties of the catalyst were evaluated using H₂ temperature-programmed reduction (H₂-TPR) and X-ray photoelectron spectroscopy (XPS). As a result, the Mn⁴⁺ and Ce³⁺ peaks increased with the addition of W in H₂-TPR. Also, when the tungsten 5 wt.%, the ratio of Mn⁴⁺ and Ce³⁺ species present the highest. Thus, The ratio of Mn⁴⁺ and Ce³⁺ was confirmed an important factor on the reaction of low temperature SCR. (This subject is supported by Korea Ministry of Environment (MOE) as “Advanced Technology Program for Environmental Industry”(RE201411036))

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