

디젤 엔진에서 엔진 속도와 SCR 촉매 온도에 따른 SCR 내 NH₃ 흡

착 속도와 탈착 속도에 대한 연구

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Study on adsorption and desorption rate of NH₃ in SCR according to engine speed and SCR temperature in diesel engine

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SCR (Selective Catalytic Reduction) is used to remove NO_x from diesel engines using NH₃. If it does not react with NO_x then SCR released NH₃ and it causes air pollution. In order to prevent such problems, it is necessary to precisely control the number of urea injected into the SCR of the vehicle. For this purpose, it is necessary to study the mechanism of NH₃ absorption in the SCR according to the engine and catalyst conditions. In this study, we analyzed the rate at which NH₃ adsorbed to SCR and the rate at which adsorbed NH₃ was desorbed after stopping urea water injection when urea water was injected under various engine conditions. The engine speed and load were changed, and the number of urea was injected in such an amount that NH₃ could purify NO_x at a ratio of 1: 1 according to the NO_x value discharged. The amount of NH₃ adsorption inside the SCR is greatly affected by the engine speed. However, desorption rate decreases as the temperature increases. Through this, NH₃ adsorption rate and desorption rate are important factors in determining urea water injection amount. The NH₃ adsorption rate is affected only by the SCR temperature, while the desorption rate increases with increasing engine speed and SCR temperature. The NH₃ adsorption rate in the SCR is related to the phenomenon that the NH₃ adsorption amount decreases as the SCR temperature increases. The NH₃ desorption rate in the SCR is affected by both the engine speed and the temperature, which increases the internal NH₃ adsorption amount as the SCR temperature increases and affects the desorption rate as the engine speed increases and the space velocity inside the SCR increases. Based on these results, the NH₃ adsorption rate and desorption rate in the SCR are high when the engine is at high load. Therefore, urea water should be injected in the amount of urea to adjust the ratio of NO_x to NH₃ to 1: 1, The number of urea should be injected based on the amount of NH₃ adsorbed.

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