

Study on reimplementation of automotive catalyst poisoning and identification of key factor on catalyst activity degradation

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Gasoline automotive catalyst has been guaranteed 10 years of use or 50,000 km of mileage. It is common sense in mass production manufactured gasoline automotive catalyst. Nevertheless, under guaranteed operating ranged catalyst seldom failure on expected catalytic activity such as low conversion rate on NO_x, CO and HC, delayed light off temperature and increment of backpressure. In case of field claims were mainly occurred by accumulation of catalyst poisoning element such as S, P, Zn and Ca or exposure of extremely high temperature over 1000°C.

In order to designing field claim catalyst by lab scale experiment, various concentration of P sources such as 0 wt% to 3.0 wt% were applied to commercial automotive catalyst at various temperature such as 1150, 1200 and 1250 °C. Testing matrix of catalyst poisoning was composed by 9 cases of each condition. Testing matrix applied samples were analyzed by XRD, XRF, BET and catalytic activity test by synthetic gas bench.