Photocatalytic partial oxidation of diesel like hydrocarbon for DeNOx application

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We have prepared photocatalytic partial oxidation of dodecane system to produce oxygenated hydrocarbon and H_2 for reducing NOx so that we can decrease NOx emission from diesel fuel vehicle. There are many photocatalytic partial oxidation results of short chain and aromatic hydrocarbon. And a few of reports exist regarding long chain alkane such as dodecane (tetrahedron 58 (2002) 2943-2950, Marine Chemisrty 58 (1997) 361-372). but these came from air-equilibrated aqueous TiO_2 suspention system different from vehicle exhaust gas line environment in which there is lack of H_2O compared with aqueous suspension batch system. In this circumstances, we conduct the experiments which resulted in CO_2 formation and little amount of dodecane was partially oxidized to aldehydes whose selectivity seemed to be the highest among Oxygenated hydrocarbons(OHC). Scarce amounts of H_2 also detected. To increase OHC selectivities, we will decrease oxygen composition. After finding optimized reaction condition, photocatalyst would be changed from commercial anatase phase TiO_2 to surface modifided TiO_2 or other materials such as MoO_3, V_2O_5/SiO_2.