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Polluter-Near Catalytic Degradation of Diesel Exhaust Gases

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***Abstract*-**It is suggested to equip diesel vehicles with a photo-catalytically active TiO_2 coating on the car painting or self-adhesive films on the engine bonnet and car roof to decompose the NO_x diesel exhaust gases near the polluter itself. Such cheap foils may also be used to glue other free surfaces near the busy car traffic.

Keywords*-Diesel Car, NOx Exhaust Gases, NOx Decomposition Photocatalytically Active Foils, TiO_2 Coating*

I. INTRODUCTION

In a recent publication, the present author has summarized some ideas concerning the reduction of the NO_x content of the air [1]. One option was the photo-catalytic NO_x degradation on TiO_2 coated roof tiles [2]. In this short contribution, it is proposed to apply this technique to the main polluter itself, the diesel car.

II. THE PROPOSAL

It is suggested to equip the diesel car varnishing with a transparent respectively semi-transparent coating of photo-catalytically active TiO_2. Harmful NO_x of the air will be effectively decomposed into N_2 and O_2. Respectively. The driving force of the car can further support desorption of the decomposition products from the coated surface and enhances the gas throughput. While the development of an active coating of the car varnishing is a time-consuming process, a self-adhesive foil with TiO_2 coating as a cheap rolled product can be developed within weeks. The foil can be glued on the engine bonnet and the car roof, covering about 2 m^2 of the surface of the car. Supposed that the amount of nitrogen oxides is twice as high on the inner city streets respectively highways than on residual roofs, the same amount of NO_x breaks down per year as a car is driven 700 km. A complete coating of the car's surface would break down a NO_x exhaust gas equivalent to about 1500 km driven per year. This represents roughly about 10% of NO_x release of a car driven 15000 km per year. A feasibility study should confirm the sustainability of such simple and cheap application.

The proposed cheap foil technique could also be used to glue free surfaces near busy inner city roads or on the highways.

III. CONCLUSIONS

This contribution describes a simple and cheap possibility to clean the air from toxic NO_x exhaust gases of a diesel car by means of a surface coating of the car. The development of a photo-catalytically active TiO_2-based self-adhesive foil can be realized soon and cost-efficiently. It is expected that about 10% of the NO_x release of a car can be decomposed into N_2 and O_2 by this sustainable action. The proposed foil technique is also proposed to glue other free surfaces near the busy car traffic.

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