

## CATALYTIC TRAP TO REMOVE EMISSIONS FROM COMBUSTION ENGINES

### TECHNOLOGY DESCRIPTION

Fuel fed to internal combustion engines is burnt and leads to carbon dioxide and water. However, other products are generated when combustion is not complete. These products are carbon monoxide and non-burnt hydrocarbons.

Off gases treatment in internal combustion engines is a well known technology. The main aspect to be considered is that catalysts do not start working until 200°C in both, diesel and petrol engines. This is why hydrocarbon emissions from combustion engines are produced mainly during starts at cold temperatures.

A research team from the University of Alicante has developed a new catalyst, noble metal free, to reduce hydrocarbon emissions (during cold start) in internal combustion engines.

This technology development consists of a catalytic trap based on an adsorbent material to reduce hydrocarbon off gases emissions in combustion engines, particularly at the starting phase. The catalytic trap is designed without noble metals and has one or more layers of a molecular sieve with one or more transition metals (Cu, Fe, Co, Zn, Ni).



*Monolithes used for supporting the catalytic trap to be installed in engines.*

The main difference with other existent materials is the absence of noble metals, making possible the removal of hydrocarbons in only one catalytic bed without high valued metals. This allows the catalytic trap to be installed in different positions of the engine according to control systems of the engine.

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### APPLICATION SECTORS

Because of the relation of this material with combustion engines, mechanical and automotive sectors are the main application sectors for this technology.

Other application fields are:

- Energy Generation and Electricity Generation.
- Industry (Chemical Industry, ceramics, polymers, paintings, etc.).
- Chemistry and Materials (Material and catalyst manufacturers).

### TECHNICAL ADVANTAGES AND INNOVATION

- Combination of both functions, hydrocarbon trap and single bed oxidation catalyst during cold start of the engine.
- Structural Advantages (simplification of pollutant control and reduction systems in engines)
- Economical advantages (No noble metals used. Noble metal Price is around 100 times the price of metals used in this catalyst).
- The catalytic trap can be used in any position along different control systems of the engine.
- This material, at high temperatures, can carry out the total oxidation of hydrocarbon exhausts converting them in a gas flow able to be sent out to atmosphere.



*Pilot equipment to test the catalytic trap behavior*

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### CURRENT STATE OF THE TECHNOLOGY

The material has been developed at a lab scale and pilot scale tests simulating combustion engines exhausts have been performed.

### INTELLECTUAL PROPERTY RIGHTS

The technology is protected under patent application.

- Title: "Catalytic trap for hydrocarbons contained in the emissions of an internal combustion engine"
- Application Number: P201130814.
- Application Date: 2011, May, 19th.

PCT application has been filed and the international extension is available

### COOPERATION SOUGHT

The research team is looking for companies / institutions to:

- License the patented technology in order to be introduced in the market.
- Setting up new R&D projects aiming at opening new R&D lines, develop new technologies, etc.

### CONTACT

Víctor Manuel Pérez Lozano  
SGITT-OTRI (Universidad de Alicante)  
Teléfono: +34 96 590 3467  
E-Mail: [otri@ua.es](mailto:otri@ua.es)