

Oxygen Storage Materials CZ

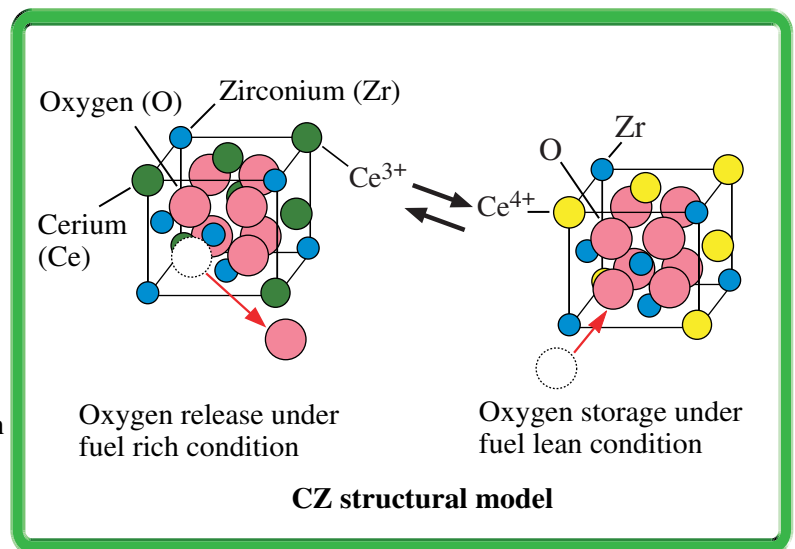
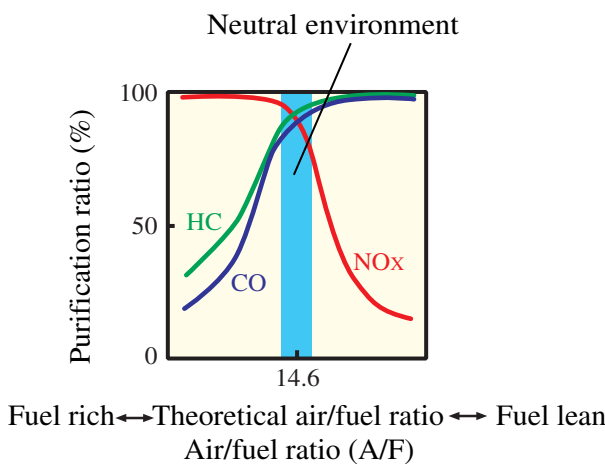
Aim

To develop CZ* catalytic material for use in automobiles that is capable of storing and releasing oxygen to aid in the purification of emissions.

(* CZ: Ceria Zirconia Solid Solution)

Principle

- In a neutral environment in which there is neither excess nor deficiency of oxygen, a three-way catalyst has a high purification capacity for nitrogen oxide (NO_x), carbon monoxide (CO), and hydrocarbon (HC), all of which are found in emissions gas.
- Ceria zirconia solid solution stores and releases oxygen by converting the valence of Cerium (Ce) between 3+ and 4+.



Characteristics of three-way catalyst

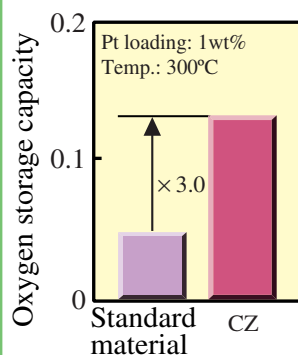
Characteristics

- At 300°C, the storage capacity of CZ is 3 times that of standard storage material.
- The NO_x emissions from a catalyst utilizing CZ are 40% lower than those of a standard catalyst.

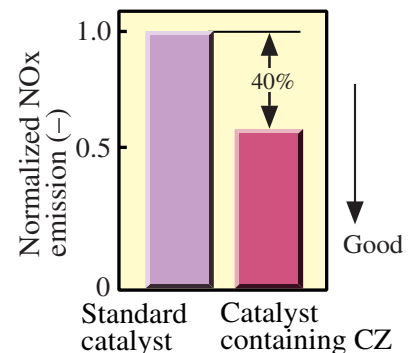


Purification of emissions

Oxygen storage capacity: theoretical value of 1.0



Improvement of oxygen storage capacity



Reduction of NO_x emission
(Data from Toyota)

Application

At Toyota, used in almost all three-way catalysts for gasoline powered automobiles. Also used by other automobile manufacturers.