

General information

File No.: 70

Technology: Catalytic oxidation with cold plasma

Typology: Processing gaseous fraction



Goal: Treatment of air pollutants, combustion gases, etc. Especially for the oxidation of NO_x, CO and VOCs by means of a catalytic bed of metal oxides, the most common being TiO₂, which decomposes ozone using plasma and high intensity electric current and generates a current highly reactive ionized to oxidize the compounds to be treated.

TRL: 9

Status: Consolidated

Complexity: High

Inlets:

Gases with polluting compounds that are difficult to oxidize by biological means or under mild oxidation conditions (VOCs are very hydrophobic and difficult to absorb, adsorb and degrade). They can come from industrial sources, combustion, or waste treatment/valorization processes

Products:

Oxidized gaseous pollutants (CO₂, NO₂, SO₂, etc.)

Other outputs:

Exhausted catalyst

Consumption

Energy: High

Water: Not applicable

Reagents: Not applicable

Efficiency:

Oxidation efficiencies >90%

Economics

Investment:

The budget is high

Operation:

The budget is high

Strong points:

Highly efficient system for the oxidation of gaseous pollutants.

Weak points:

Need for additional stages of removal of gaseous compounds;
Consumption of expensive catalysts and energy in the form of light;
Generation of complex by-products to characterize.

Others: Process of high operational complexity.

Technology train:

1. Incineration -> Catalytic oxidation with cold plasma;
2. Drying -> Catalytic oxidation with cold plasma.