IMPROVING THE OPERATION OF FILTERING SYSTEMS BY METHODS OF CLEANING GAS EMISSIONS

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Pollution of hazardous chemicals is now considered one of the main problems of ecology. The methods of purifying gas emissions depending on the physic-chemical properties of pollutants, including hazardous chemical ones, their aggregate state, concentration in the gaseous medium are considered. It has been proved that practically any organic compounds can be oxidized (mineralized) on the TiO_2 surface. Photocatalysis is suitable for household use, as it can occur at room temperature. For example, the thermocatalytic way of destroying harmful substances requires preheating of air to temperatures above 200°C.

Photocatalysis destroys substances that penetrate even through activated carbon-based filters. Peculiarities of formation of oxide coatings by plasma-electrolytic oxidation of titanium alloys are considered. Therefore, it is proposed to equip the design of collective defense systems on armored vehicles and stationary objects with the additional installation in a filter-sink of a network with a deposited layer of catalytic material that will neutralize various types of hazardous chemicals by photocatalytic purification of air by titanium oxides.

Having considered the existing air purification methods, it should be noted that photocatalytic gas purification is the best method of air purification, in which titanium alloys are used as a photocatalyst, which are able to effectively neutralize (decompose) toxins of various nature with high performance in a wide temperature range. Therefore, in the future, it is possible to consider the installation of filter-absorbers of filter-ventilation units on armored vehicles and stationary objects of the mesh with oxide systems of titanium alloy to neutralize the HCHS.

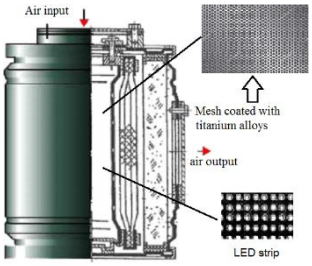

Fig. 1 – Installation of mesh coated with titanium dioxide in the collective protection system

The improvement of the absorber filter on the armored equipment is shown in which a network with a deposited layer of a catalytic material with the penetration of UV rays on its part of a surface is installed (Fig. 1).

The optimal method of air purification from HCHS is photocatalytic air purification, where titanium dioxide is used as a photocatalyst, which can efficiently neutralize (decompose) different kinds of toxins at high rates of efficiency over a wide range of temperatures.