

THE USE OF PHOTOCATALYTIC TECHNOLOGY FOR THE DISINTEGRATION OF HAZARDOUS CHEMICAL SUBSTANCES

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The experience of recent years shows that in modern world the threat of using nuclear, biological and chemical weapons as well as high-precision weapons remains, as a result of which potentially hazardous facilities can be destroyed. There are more than 1,5 thousands chemically dangerous objects on the territory of Ukraine, whose activity is related to the production, use, storage and transportation of hazardous chemicals, and more than 22 million people live in the areas of their location. The danger of functioning of these objects of economic activity (chemically dangerous objects) is related to the probability of accidental emissions (spillages) of a large number of hazardous chemical substances (hereinafter referred to as "HCHS") outside the objects, because many of them retain 3-15 daily supplies of chemicals.

In works, it is indicated that in collective protection system it is possible to improve the performance characteristics without significant structural changes and significant material costs due to the additional installation of a cleaning system in filter-ventilator installations (units) on armored vehicles and stationary structures.

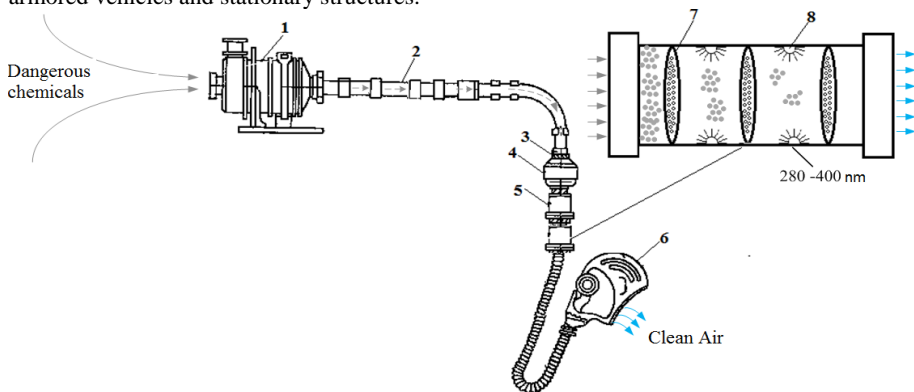


Fig. 1. Scheme of improvement of the filter-ventilator unit FVU-3,5:
1 – filter-ventilator unit assembly FVA-3,5; 2 – hose; 3 – valve; 4 – canister;
5 – electric radiator; 6 – facepiece; 7 – titanium alloy mesh; 8 – LED

This will enable to neutralize (decompose) toxins of various nature at high efficiency performance in a wide range of temperatures and corrosion resistance. In the purification system, the polluted air passes through the meshes of titanium (IV) oxide coated with a layer of catalytic material, which receives ultraviolet rays from the LEDs installed in the system. This makes TiO_2 a very strong oxidizing agent, which allows the decomposition of harmful substances through their photocatalytic oxidation to safe H_2O and CO_2 .