

# Forensic investigation of microscopic traces of explosives and explosive devices in humans

## Opinion

The study of the nature of explosive material and explosive devices enables to improve, modernize and develop the new research facilities, acceptance and methods of the findings, conservations, commitment and withdrawal to of criminal law on significant information on tracing of the use of explosive devices and explosive materials. Using terrorist explosive devices, deftly camouflaged in home subject, hidden under clothes of the person (the terrorist- kamikaze), brings, as a rule, to greater amount of the victims and inflicts essential moral and material harm. For the inspection of people in public places there are checkpoints for the presence of explosive devices under clothing and (or) in hand luggage.<sup>1-3</sup> Such posts can be permanent and temporary. The main technical means of inspecting hand luggage and clothing of people for the presence of explosives and explosive devices are X-ray introsopes. In practice, a stationary metal detecting device is used to inspect the overall dimensions and the detector of the hand luggage being viewed up to 500x400x350 mm. Such devices are powered by a single-phase 220-volt mains and a power consumption of 1,500 volts. Also, a stationary threshold signaling device for gamma and beta radiation with a trigger threshold of 30-60mk is used, per second, powered by AC 220 volts and power consumption no more than 10 volts amperes.

Through a stationary metal detector, a person must pass without hand luggage, which is inspected separately. The sensors of a stationary radiometer are installed at the entrance, when a person has carry-on luggage. When the sensors are triggered, the radiation source is detected using a search signal light. If suspicious, it is necessary to consider hand luggage, on an x-ray image of which the elements characteristic for explosive devices are found. In such cases it is necessary to obtain detailed explanations from the owner of this hand baggage about its contents. In case of suspicious behavior, such person is subject to detention. Explosive substances are determined by microparticles and microlides of such substances on the clothes and body of the offender or the victim, as well as on the objects of the scene. Inspection of people should start with clothing, not removing the last. Special attention should be paid to buttons, fasteners, hooks, buckles, etc. In seams, folds, monsters, etc. where microscopic explosives can remain, so it is necessary to use appropriate magnifiers and the like.<sup>4</sup> The search for micro-traces on the human body is carried out with the help of loops or microscopes under bright light emitted by an OI-18 illuminator or a halogen lamp, as well as an ultraviolet illuminator and an electron-optical converter.

Inspection of people can also be carried out using chemical rapid tests. Traces of explosives on the hands and clothing of a person persist for several hours. Washing hands with soap does not guarantee the disposal of trace microquantities of explosives on the hands. The suspect may be asked to hold a certain object (pen, umbrella, etc.) for a short time in the hands or transfer some of his personal items. Terrorists and manufacturers of improvised explosive devices can

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also be identified by analyzing their hair, which retains the presence of the smallest particles of explosives even after repeated washing of the head.<sup>5</sup> This allows us to conclude that explosives penetrate the hair structure and are more actively retained in dark hair than light ones, which is explained by the role of melanin pigment, which gives the hair color. At the same time, it was not possible to identify a single chemical group common to all explosives, which can be responsible for such a stable fixation in the structure of the hair.

It was found that unlike drugs such as heroin and cocaine penetrating the hair through the blood, explosive substances simply evaporate and are fixed in the hair of people who deal with them. In such cases, explosives can be detected with the help of specially trained dogs. The world of rapid tests do not give full information about the presence of explosives in the material under study without specifying their percentage and determining the type of explosives. To date, there is a development kit "Lakmus-4", containing reagents-identifiers of explosives for the first three groups of explosives (without a group of chlorates). To obtain evidence, explosive technical expertise is appointed, which is carried out in the framework of forensic research by the staff of expert institutions of the Ministry of Justice of Russia, the Ministry of Internal Affairs of Russia and the FSB of Russia.<sup>6</sup> The use of explosive devices by terrorists, artfully camouflaged in household items, hidden under human clothes (suicide bomber), leads, as a rule, to a large number of victims and causes significant moral and material damage.<sup>7</sup>

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## Conflicts of interest

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