

Ignition fluids as objects of chemical research in the investigation of arson crimes

© Viktor F. Kursky,^{1*} Alexey G. Shchelochkov,¹ and Artem A. Bechenkov²

¹ Saratov State University. Astrakhanskaya St., 83. Saratov, 410012. Russia. E-mail: kurskiyvf@rambler.ru

² Forensic science center of the Ministry of the interior of Russian Federation.

Z. & A. Kosmodemyanskich St., 5. Moscow, 125130. Russia. E-mail: abechenkov@mvd.ru

*Supervising author; †Corresponding author

Keywords: means for ignition, oil products, gas chromatography.

Abstract

In connection with the development of modern industry, various means appear to make the life of citizens easier, but this is also used by criminals, modifying, and sometimes leaving some objects in their original state. This is exactly what happened with a new type of ignition means – liquids for lighting firewood and charcoal. Criminals began to use such liquids as a means of crime when setting fire to buildings, structures, cars.

The article discusses the physicochemical study of liquids for ignition, sold in the retail trade network as a product for lighting firewood and coal. The wide selection and availability of these objects allows them to be used in the commission of crimes related to arson. The paper considers the range of liquids for ignition with the establishment of their chemical composition, compliance with the composition declared by the manufacturer.

A study of eleven samples, often found in the sale of means for ignition, was carried out by gas chromatography using a gas chromatograph *Kristall-5000.2* with a flame ionization detector, in addition, the obtained compositions were compared with the manufacturer's declared on the label. It was found that for a number of samples the compositions differ from those declared, for example, the manufacturer declared a mixture of hydrocarbons for the ignition fluid "Lighter", but in fact only methanol, the fluid for ignition "FLAME" declared a mixture of liquid hydrocarbons, and in fact, ethanol, ethyl acetate and diethyl acetate. Thus, the manufacturer, trying to save on ingredients and production methods, uses cheaper and simpler chemical compositions.

References

- [1] M.Yu. Bruevich, D.E. Bruevich. The setting of a crime as an element of the forensic characteristics of the deliberate destruction or damage of someone else's property, committed by arson. *Vestnik of Saint Petersburg Juridical Academy*. **2015**. No.3(28). P.79-81. (russian)
- [2] V.V. Bychkov. Investigation of Intentional Destruction or Damage of Another's Property Committed by Arson: *A Study Guide*. Chelyabinsk. **2009**. P.166. (russian)
- [3] I.M. Fitsev, V.K. Blokhin, G.K. Budnikov. Chromatographic methods in forensic science. *Journal of Analytical Chemistry*. **2004**. Vol.59. No.12. P.1289-1298. (russian)
- [4] A.A. Vorontsova, D.V. Kalashnikov, A.A. Lipsky, O.A. Esatov. Problems and prospects of the use by fire-technical specialists of modern methods of detecting and researching means for arson. *Bulletin of the Voronezh Institute of the State Fire Service of the EMERCOM of Russia*. Voronezh. **2017**. No.2(23). P.72-77. (russian)
- [5] V.F. Kurskiy, D.V. Kairgaliev, I.N. Melnikov. New initiators of combustion used by criminals to commit arson, their characteristics and properties. *In the collection: Scientific Almanac. Collection of scientific papers*. Moscow. **2020**. P.117-120. (russian)