

# **Analysis of explosive material from several firework and gunshot residue by using analytic techniques and electronic nose**

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## **Abstract**

Nowadays, explosive materials are used widely such as firework and primer cap in bullet. Three elements i.e. antimony, barium and lead, are mainly used in pyrotechnics and bullet. Explosive materials can be classified by many techniques, in this research, gas chromatography-mass spectrometry(GCMS) and atomic absorption spectroscopy(AAS) techniques are used to detect several explosive materials. These materials are also investigated by electronic nose system. Several types of explosive products were investigated including fountain, roman candles, sparklers and gunshot residue because there are two interested function i.e. combustion to appear in various color and to make explosive force. Result from atomic absorption spectroscopy and gas chromatography-mass spectrometry are used to determine chemical element, different substance compound and volatile gas substance. For electronic nose, result can be described similar to these results from analytical techniques. The electronic nose system can be used to classify the type of explosive products.

Keywords: Electronic nose, Explosive material, gas chromatography, sensor array

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**Track Classification:** Material Physics, Nanoscale Physics and Nanotechnology