DOI 10.36074/15.05.2020.v2.16

QUANTITATIVE ANALYSIS OF THE TENSORESISTANT SENSOR MOBILE ANALYZER «NITON» XL-2

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The NITON XL-2 mobile analyzer (fig. 1) works according to the X-ray fluorescence analysis method. This allows you to analyze the concentrations of elements in different materials [1].

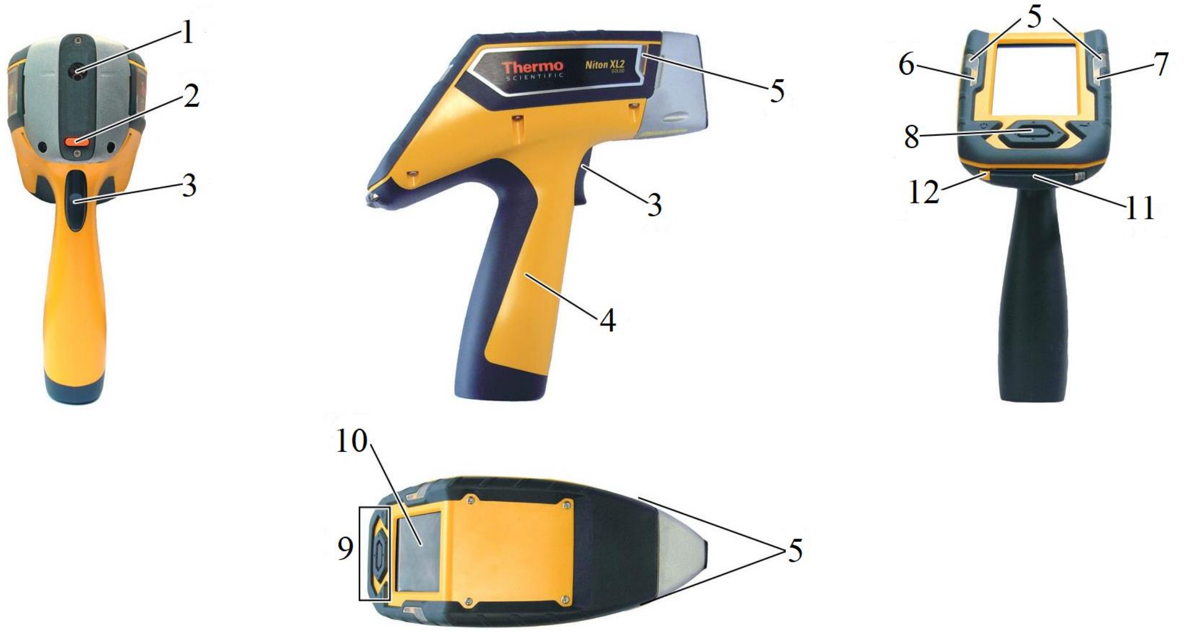

Fig. 1. **The structure of the x-ray fluorescence analyzer "NITON" XL-2**
1 – measurement window; 2 – front switch; 3 – trigger switch on the handle of the device; 4 – device handle (with battery inside); 5 – signal lamps; 6 – Bluetooth LED; 7 – Pass/Fail LED; 8 – rear switch; 9 – device control keyboard; 10 – touch screen unit, touch screen; 11 – rubber cover (terminal block for data cables and external power supply); 12 – stylus.

Examples of applications: analysis of metal alloys for material identification, screening of toys, consumer goods, electronics, and use to ensure quality control in the manufacturing process. The NITON XL-2 analyzer can also be used for soil and sediment analysis, environmental monitoring, geochemical mapping, forensic analysis, and metal layer thickness [2].

To analyze the material of the sensing element, the strain gauges were housed in a special plastic container. The container was housed in a test facility that had a lead plate to protect the operator, during analysis, from x-rays.

After the analysis, the information of the factory of the manufacturer of the strain gauge resistor was found as to the material from which the sensitive element of the strain gauge resistor was made, namely the wires were actually made of constant (Cu-Ni-Mn).

Information on the material of the sensing element from which the wires of the strain gauge is made is necessary for the calculations based on the results of the experimental study.

References:

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[2] Philip, J.Potts, Peter, C.Webb (1992). X-ray fluorescence spectrometry. Journal of Geochemical Exploration. 44 (1–3), 251 – 296. https://doi.org/10.1016/0375-6742(92)90052-A.

DOI 10.36074/15.05.2020.v2.17

QUANTUM COMPUTATIONS AS A THREAT TO INFORMATION SECURITY

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In the modern world, technologies are developing every day, and the development of quantum computers also does not stand still. At the same time, there is now a significant increase in the speed and volume of information transmitted through communication channels. In this regard, a huge risk for existing technologies is the creation of an effective quantum computer, which potentially reduces the strength of asymmetric cryptographic algorithms and symmetric key generation algorithms. Current quantum technologies pose a security question, since the probability of breaking into existing cryptosystems by exhaustive search over the entire key space is very high, and the factorization and discrete logarithm problems, on which many modern algorithms are based, are becoming solvable.

Consider the most commonly accepted encryption algorithms in the world. The safety of asymmetric algorithms is based on the complexity of solving a certain mathematical problem. For example, the RSA algorithm, widely used in cryptography for encryption and key generation, is based on the complexity of the factorization problem. The DSA algorithm usually used for electronic signatures is based on the difficulty of taking logarithms of the final fields. The Diffie-Hellman protocol (including that which is based on elliptic curves) is also used to encrypt further exchanges using symmetric keys.