SOME PROPERTIES OF SEMICONDUCTORS USED IN MODERN COMMUNICATION TECHNOLOGIES

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Modern technology materials are an integral part of the electronic devices that surround us [1-5]. Semiconductor materials, such as telluride-based compounds, play an important role in various technological applications, especially in electronics and optoelectronics [6-8]. The construction phase in the crystal structure of $Cu_{1.55}Zn_{0.35}Te$ refers to the arrangement of atoms or ions within the crystal lattice during its formation. $Cu_{1.55}Zn_{0.35}Te$ is a compound semiconductor composed of copper (Cu), zinc (Zn), and tellurium (Te). Understanding the characteristics of its transformations during construction provides insights into its properties and potential applications. In the article, the study of structural transformations in $Cu_{1.55}Zn_{0.35}Te$ crystal by X-ray diffractometric method is explained. Since copper atoms can be in two different valence states (Cu1+, Cu2+) in the crystals of compounds of the Cu-Te system, there are a number of non-stoichiometric compounds between the stoichiometric compounds Cu2Te and CuTe. The study of structural transformations in non-stoichiometric combinations of the Cu-Te system is of particular importance.

It was determined that the studied sample is two-phase, undergoes structural transformation from room temperature to melting temperature T ≥973 K and T temperature. For the crystal lattice parameters of the rhombic phase at room temperature, α=7.353Å, b=21.991Å, c=36.407Å, and for the hexagonal lattice parameters, α=7.350Å, c=22.495Å, and for the UMK lattice parameter of the high-temperature phase, a=6.124 Å were obtained. It was determined that the lattice parameters in the studied crystal grow linearly depending on the temperature, and only the parameter c of the rhombic phase decreases in the temperature range (290-473)K, and increases linearly starting from 473K. With a wide range of military applications, this substance can be used in thermogenerators, infrared detectors, night vision and thermal vision devices, optical military communications devices, and electronic warfare systems for detecting heat signatures or other infrared emissions associated with enemy targets.

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EFFECTIVE APPLICATION OF TELEMETRY SYSTEMS IN UNMANNED AERIAL VEHICLES

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Currently, various types of unmanned aerial vehicles (UAVs) are widely used on the battlefield and in operations as both intelligence and strike tools, and are viewed as highly effective tools that can solve combat tasks. The conduct and outcome of military operations, the degree of combat readiness of the army, and the ability to perform the assigned task depend significantly on the use of UAVs. The analysis of modern wars shows that the widespread use of UAVs makes it possible to significantly reduce the loss of manpower of units, as well as to have an advantage over the enemy both in terms of strength and morale-psychological condition. It is known that the characteristic feature of the military operations that began in Karabakh on September 27, 2020 was the effective use of various types of UAVs by the Azerbaijani Army. The Armenian army defends the occupied territories with S-300PS, S-125, 2K2 Kub, 2K11 Krug, Buk-M2, Tor-M2, OSA-AKM Air Defense and Autobaza-M, Repellent1, Groza -S, Mortira, Manushak, Pole -21 was organized in several echelons with Radio Electronic Combat systems [1-4]. From UAVs in military operations it was used in echeloning, swarming and interaction with other types of weapons. Its use for military, civilian and professional purposes is increasing rapidly, and it is interesting to study the telemetry systems used in UAVs.

Telemetry is the technology used to receive, record and transmit various data collected by UAVs during flight, collecting basic information such as its flight status, position, speed, altitude and battery level. It can also provide information such as interior and exterior conditions, engine temperature, engine speed, and GPS location. This information is essential to monitor in real-time how the UAV is operating and under what conditions, to optimize flight parameters, ensure safety and intervene when necessary. Telemetry systems provide operators with detailed