ВЛИЯНИЕ СТРУКТУРНОГО ФАКТОРА НА ЭЛЕКТРИЧЕСКИЕ СВОЙСТВА КРИСТАЛЛОВ СОСТАВА CIS-Mn(Fe)Se

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THE EFFECT OF THE STRUCTURAL FACTOR ON THE ELECTRICAL PROPERTIES OF CRYSTALS OF THE COMPOSITION CIS-Mn(Fe)Se

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The results of the study of solid solutions showed that the samples have both monocrystalline and polycrystalline structures, depending on the alloying additive. The VAC of single crystals is linear, and the VAC of polycrystals demonstrates nonmonotonicity.

The problem of renewable energy sources is relevant at the moment and in the aspect of renewable energy, the development of devices operating on the basis of new physical principles is relevant, in particular, new materials for the adsorption electric power industry are being actively developed. The conversion of the chemical energy of the adsorption of water and light into an electric form is actively used. One of these converters is a triple compound of the CuInSe2 composition, which is characterized by high photovoltaic conversion efficiency and is a promising material for use in photovoltaics [1].

Varying the structure and chemical composition of $CuInSe_2$ by changing the synthesis conditions and adding alloying elements [2] allows us to produce materials with a wide range of different physical characteristics, in particular, we can obtain materials with several conversion channels capable of converting direct sunlight energy and adsorption energy of moisture molecules into electrical form.

Thus, the study of the electrical properties and structural features of $CuInSe_2$-based crystals with the addition of different concentrations of alloying additives was the purpose of this work.

Compounds of the general formula were used as the studied objects:

xmol %MeSe-(100-x)mol %$CuInSe_2$,

where Me = Mn/Fe, x = 5, 3, 7, 10.

It was found that with the maximum addition of an alloying impurity (10mol%MnSe-90mol%CuInSe2), a single crystal is formed, in other cases we are

dealing with polycrystalline samples (x=5, 3, 7 mol%), which is reflected in their electrical properties. The voltammograms (VAC) of monocrystalline samples are linear and ordered, and an additive contribution of electromagnetic radiation and the degree of hydration of the system is observed. On the contrary, the VAC of polycrystalline samples demonstrates nonmonotonic behavior of curves and competitive dynamics on conductivity under the influence of two factors.

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