EXPERIMENTALLY INVESTIGATION OF THERMOELECTRIC MATERIALS BASED ON Bi_2Te_3: ENERGY CONVERSION SYSTEM

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Experiment

In this work, we analyzed the conditions for the onset of the ostwald maturation (OS) stage, taking into account fluctuations. Coalescence of large islands of the condensed phase proceeds with a retarded process. Filling of channels and voids occurs both by formation of new nuclei in them and by attachment of atoms directly from the molecular beam. Coalescence of small and large islands of the condensed phase proceeds differently. The nuclei coalesce without coming into contact with each other.

In this case, NRs of various altitudes at the base obtain the structure of nanopores. The nanoislands shaped at the sites of pore nucleation on the surface (0001) Bi_2Te_3 compound

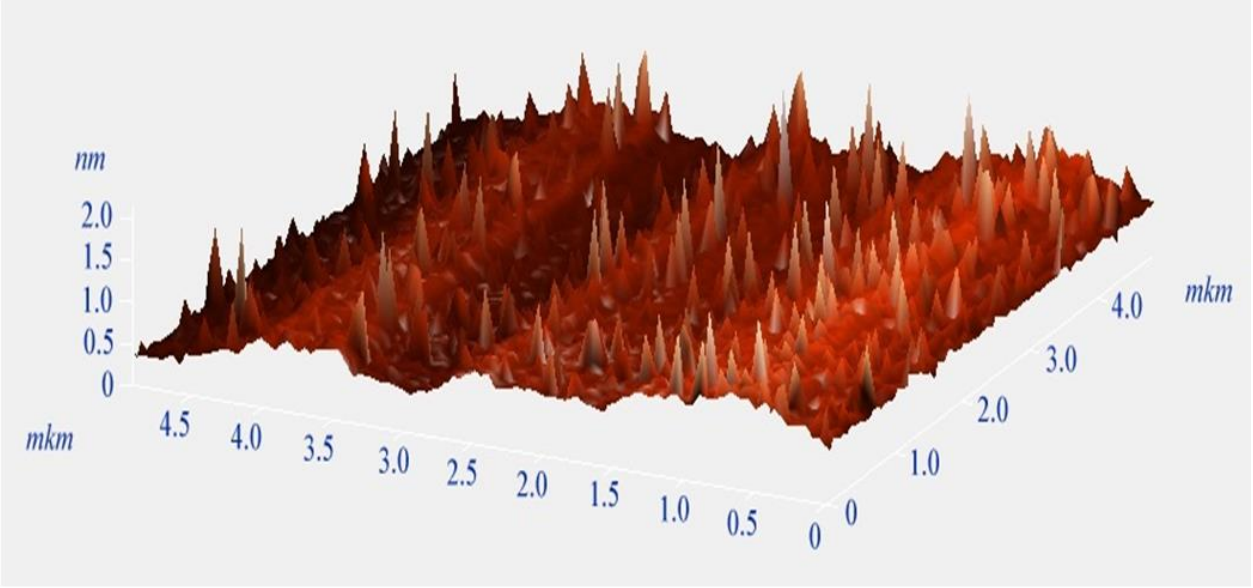
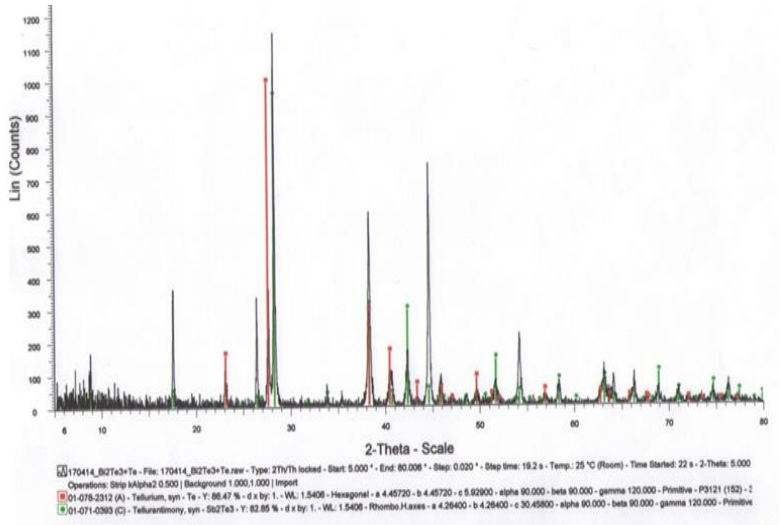


Fig.1. Nanoislands formed at the sites of pore nucleation on the (0001) Bi_2Te_3 surface.

Experiment



X-ray diffraction pattern of eutectic after Bi_2Te_3+Te irradiation with 30 Mrad.

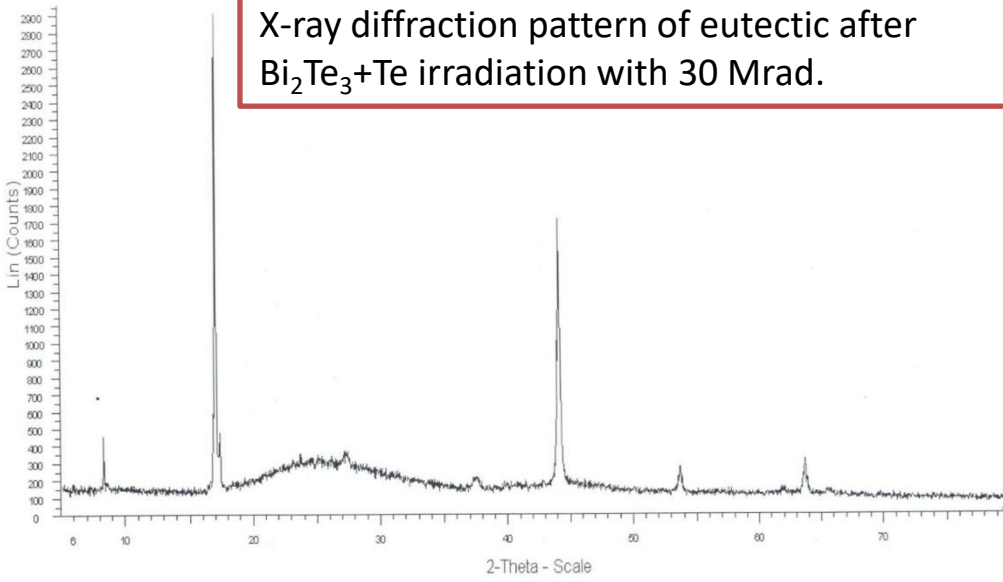


Fig.2. X-ray diagram after irradiation of Bi_2Te_3+Te.

The some smaller size of clusters are shaped with an increasing in the pore size. The comparing the surface morphology of the phases that fabricate the Bi_2Te_3-Te eutectic system before and after irradiation process. In this case the absorbed dose is about of 30 Mrad (see Figure 4). Figure 5 shows the X-ray diffraction pattern of eutectic after Bi_2Te_3+Te irradiation with 30 Mrad.

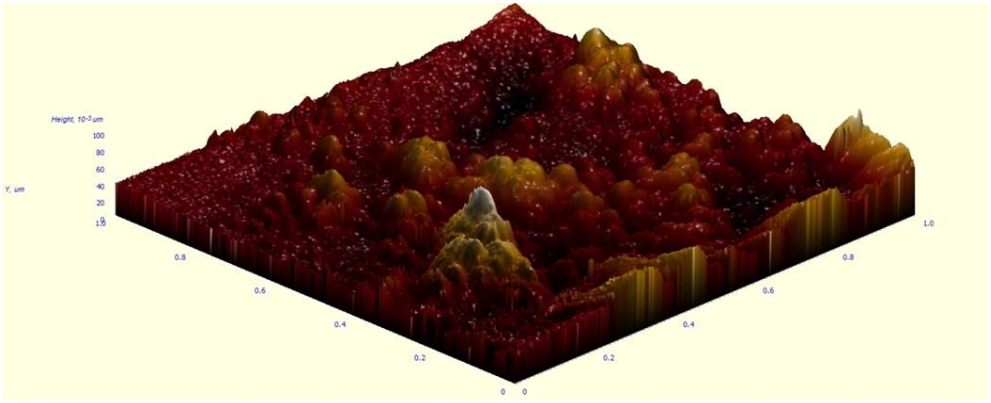


Fig.3. The shaping of cut nanoislands on the (0001) for Bi_2Te_3 compound after irradiation (30 Mrad).

CONCLUSİONS

- Mechanisms of NR generation on the surface (0001) of Bi_2Te_3 compound at the phase of Ostwald maturing; this is a model for investigating the processes of production of self-organized nanoobjects on the (0001) surface of Bi_2Te_3 layered materials.

- Affinity in the investigation of physical processes in interlayer island systems is handled basically by the case that they are an origin of useful knowledge about the nature of the interaction between the host atoms of compounds migrating over the surface (0001) of the Bi_2Te_3 and elements of the real structure of pore patterns.

- The sequence of processes of combination of vacancies and concentration small pores in Bi_2Te_3 leads to enlargement of pores.

THANKS FOR YOUR ATTENTION !