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GROWTH AND SWITCHING EFFECT WITH MEMORY IN BINARY COMPOUND DITHALLIUM TRITELLERIDE SINGLE CRYSTAL

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Abstract

The goal of this paper is to present experimental results of the switching effect and analyze qualitatively the influence of various factors such as temperature, light illumination and sample thickness on switching behavior of the high quality binary chalcogenide semiconductor TI₂Te₃. Current - controlled negative resistance of TI₂Te₃ single crystal has been observed for the first time. It has been found that TI₂Te₃ single crystal exhibit bistable or memory switching. The switching process takes place with both polarities on the crystal and has symmetric shapes. Current - voltage characteristics of Ag-TI₂Te₃-Ag structures exhibit two distinct region, high resistance OFF state and low resistance ON state having negative differential resistance. TI₂Te₃ is a binary semiconductor exhibiting S - type I-V characteristics. The specimen under test showed threshold switching with critical field of the switching 50 V/Cm at room temperature.

Keywords

Author Keywords: TI₂Te₃; Switching; Memory; Threshold power; NDR behavior

KeyWords Plus: THALLIUM CHALCOGENIDES; PHASE-DIAGRAMS; TL₂TE₃; GLASSES; TELLURIUM; TLGATE₂; SYSTEM; FILMS

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