Mobility of Ferroelectric Domains in Antimony Sulfoiodide

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Nowadays, there is a growing interest in application of ferroelectric semiconductors in electronics, e.g. in diodes, photodiodes, and ferroelectric random access memories [1, 2]. Antimony sulfoiodide (SbSI) is a promising semiconducting ferroelectric with interesting properties, e.g. piroelectric, pyrooptic, electrooptic, and gas sensing.

For the first time mobility of ferroelectric domains in SbSI has been determined using optical transmittance near Curie temperature (T_C=293 K) due to different optical energy gaps in ferroelectric and paraelectric phases as well as due to scattering of light on the domain borders. The investigated SbSI single crystals have been grown from vapour phase and equipped with electrodes. Various electric fields have been applied along the c-axis of the crystals. Motion of the domain borders have been recorded using Carl Zaiss Stemi 2000C microscope equipped with Olympus DP25 digital camera. Least square fitting of the linear dependence of velocity of domain borders on electric field (Fig. 1) allowed to determine mobility $\mu=8.11(44)\cdot10^{-8}$ m^2/Vs.

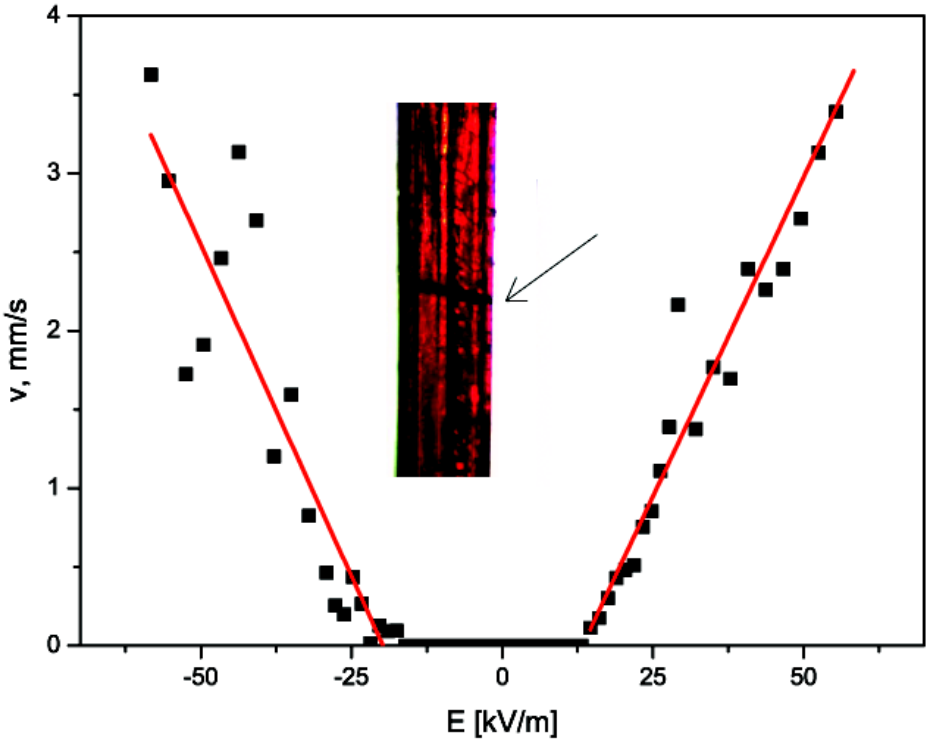

Fig. 1. Velocity of ferroelectric domain boundaries in SbSI single crystal as a function of electric field. Arrow in inset shows the domain border in the crystal.

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[1] J. F. Scott, Science **315,** 954-959 (2007).
[2] B. Toroń, M. Nowak, A. Grabowski, M. Kępińska, Acta Phys. Pol. A **124,** 830-832 (2013).