THE VERWEY PHASE TRANSITION OF THE MAGNETITE SURFACE STUDIED BY ION SCATTERING SPECTROSCOPY

N.-T.H. Kim-Ngan and W. Soszka

Institute of Physics, Pedagogical University Podchorazych 2, 30-084 Krakow, Poland

Low energy ion scattering technique with 5.5 keV He^+, Ne^+, Ar^+ and Kr^+ ions in the temperature range from 95 K to 300 K was used to study the insulator-metallic phase transition (i.e. the Verwey transition) of the surface of a single-crystal magnetite. A very deep minimum around 120 K and a small maximum around 135 K in the temperature-dependent curve of the scattered ion yield have been observed for all bombarding ions. These anomalies have been attributed to the Verwey transition of magnetite, indicating that the surface phase-transition temperature is quite close to the bulk one. The large effect of the phase transition on ion scattering from the magnetite surface was well explained in the frame of the neutralization of incoming and outgoing ions, of the target-material transparency and by a change of number of the trajectories containing ionized collisions.

9.7 cm

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
poster

Corresponding author :
N.-T.H. Kim-Ngan

Address for correspondence :
Institute of Physics, Pedagogical University
Podchorazych 2, 30-084 Krakow, Poland
Fax +48-12-6372243
Phone +48-12-6378286

Email address :
tarnawsk@wsp.krakow.pl