

ELECTRONIC STATES OF MAGNETITE FROM ELECTRON PHOTOEMISSION SPECTROSCOPY

R. Zalecki^a, A. Kołodziejczyk^a, J. Korecki^{ab}, A. Kozłowski^a, N. Spiridis^b and Z. Kąkol^a

^aDepartment of Solid State Physics, AGH University of Science and Technology, Mickiewicza 30, 30-059 Cracow, Poland

^bInstitute of Catalysis and Surface Chemistry, Polish Academy of Sciences, 30-239 Cracow, Poland

The core- level and valence band photoemission spectra for epitaxial thin film and bulk single crystal of magnetite were measured by the X-ray (XPS) and the angle- resolved ultraviolet (ARUPS) photoemission spectroscopy. The 3d electron on-site correlation energy, the 3d-2p electron charge transfer energy and the hybridisation energy between Fe-3d and O-2p states were obtained. They were calculated from the energy separations between the Fe-2p main lines and their satellite lines and from the iron and oxygen Auger spectra together with the relevant valence band spectra according to the Zaanen, Sawatzky and Allen (ZSA) theory. The ARUPS spectra were compared to the accessible band structure calculations. Type of insulating gap in these oxides was discussed.

13.4 cm

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Corresponding author :

A. Kołodziejczyk

Address for correspondence :

Department of Solid State Physics, AGH University of Science nad Technology, Mickiewicza 30, 30-059 Cracow, Poland

Email address :

akolo@uci.agh.edu.pl

9.7 cm