

***55th IUVESTA Workshop on Electron Transport Parameters
Applied in Surface Analysis (transpar)***

September 14-17, 2008

Siófok, Hungary

Sponsored by the Applied Surface Science Division of IUVESTA

I. Brief Scientific Report

Knowledge of electron transport in solids is necessary for performing quantitative surface analysis by applying techniques like Auger-electron spectroscopy (AES) and X-ray photoelectron spectroscopy (XPS). The parameters of transport equations are still rather uncertain and their study is of great importance.

The Workshop, similarly to the very successful previous IUVESTA Workshops on Auger Electron Spectroscopy (Saint Pierre de Chartreuse, 1995), reported in Surf. Interface Anal. **26**(1998)72; on 'X-ray Photoelectron Spectroscopy: from Physics to Data' (Hortobágy, 1999), reported in Surf. Interface Anal. **29**(2000)671; on 'XPS: From Spectra to Results-Towards an Expert System' (Saint Malo, 2002), reported in Surf. Interface Anal. **36**(2004)225; and on 'Electron Scattering in Solids: from fundamental concepts to practical applications' (Debrecen, 2004), reported in Surf. Interface Anal. **38**(2006)88; under the sponsorship of the International Union of Vacuum Science, Technique and Applications, brought together experts this time in the field of Electron Transport Parameters Applied in Surface Analysis. The organization of the present meeting was motivated by *i*) the recent progress in experimental methods and theoretical models studying electron transport phenomena in solids, *ii*) the significance of knowledge of electron scattering and excitation processes (relevant in electron transport phenomena) in solids, for quantitative applications of electron spectroscopies. The aims of the Workshop were *i*) to review the present status and level of understanding in the field of electron transport in solids, *ii*) to identify issues of key importance (*hot topics*) in the light of most recent scientific results and *iii*) to stimulate discussions leading to a deeper understanding and to new solutions for the existing problems.

The scientific field and scope of the Workshop falls within the area of activity of the Applied Surface Science Divisions of IUVESTA. Attendance at the Workshop was ensured in the first instance by invitation. Many of the best and most active researchers of the field participated in the meeting. The 36 participants of the Workshop represented 15 countries (including 13 member countries of IUVESTA) of Asia, Australia, Europe, North and South America. The scientific program of the meeting was developed by the Scientific and Program Committee, L. Kövér (Hungary), C. J. Powell (USA), A. Jablonski (Poland), M. Menyhárd (Hungary) chair. The Local Organizing Committee, with M. Menyhárd (Chairman), S. Gurbán, A. Sulyok was responsible for the local matters of organization and for ensuring appropriate conditions for the meeting.

Financial questions like registration, contracts for accommodation, meals and transportation were handled by the Roland Eötvös Physical Society (Budapest, represented by Mrs. Margó Nagy).

The structure of the scientific program based on sessions of about 100-120 minutes duration. There were two sessions in the morning and in the afternoon as well. Between the sessions informal discussions took place with refreshments provided. In each session enough time was

ensured for extended and intense scientific debates and discussions between the experts present. The Invited Reviews were followed by some contributed presentations of the same topic. The sessions were moderated by selected experts of the particular topics. Attached please, find a copy of the scientific program and the list of the participants.

The venue of the meeting was the Guest House of the Hungarian Academy of Sciences at Siófok (Lake Balaton). Since the whole complex was booked for the meeting and thus not other people were present it provided a relaxed atmosphere for the **Workshop providing ample possibilities for informal discussions.**

Because of the dense technical program no social event was offered except the conference dinner in a nearby typical Hungarian restaurant (csárda).

II. Financial Statement

Here it is certified that the financial support of 10.000.- CHF provided by the IUVSTA for the *55th IUVSTA Workshop on Electron Transport Parameters Applied in Surface Analysis*, was fully used to cover fixed costs, namely the cost of 15 invited Reviewers.

Budapest, September 27, 2008.

Dr. Miklós Menyhárd
Chair, International Program Committee
Chair, Local Organizing Committee

Enclosures:
Scientific program
List of Participants

The workshop will run
from 3:45pm Sunday (2008 09.14)
until Wednesday noon (2008.09.17)

The schedule of the workshop is as follows

Sunday

Chair: Takaharu Nagatomi

15:45 - 16:00		Informal opening
16:00 - 16:40	Cedric Powell	EFFECTS OF ELASTIC SCATTERING AND ANALYZER-ACCEPTANCE ANGLE ON THE ANALYSIS OF ANGLE-RESOLVED XPS DATA
16:40 - 17:00	Alberto Herrera-Gomez	The desired accuracy on the electron transport parameters for quantitative ARXPS analysis
17:00 - 17:40	Aleksander Jablonski	THE BACKSCATTERING FACTOR IN AES. REVIVAL OR A NEW CHALLENGE?
17:40 - 18:00	Petr Jiricek	ELECTRON ATTENUATION AT THE Cu(111) SURFACE

Monday

Chair: Cedric Powell

9:00 - 9:40	Shigeo Tanuma	ANALYSIS OF ENERGY DEPENDENCE OF ELECTRON STOPPING POWERS IN ELEMENTAL SOLIDS OVER THE 100 - 30,000 EV ENERGY RANGE
9:40 - 10:00	Károly Tókési	Monte Carlo simulation of electron spectra backscattered elastically from double-layer sample at relativistic energy
10:00 - 10:40	Wolfgang Werner	Quantitative analysis of Reflection Electron Energy Loss Spectra: Establishing a Database for Optical Constants
10:40 - 11:00		Discussion with refreshments

Chair: Shigeo Tanuma

11:00 - 11:40	Chuan-Jong Tung	INELASTIC INTERACTIONS OF ENERGETIC ELECTRONS WITH SOLID SURFACES
11:40 - 12:20	Cheng May Kwei	INTERFACE EFFECT ON INELASTIC INTERACTIONS OF ELECTRONS WITH CYLINDRICAL SYSTEMS
12:20 - 14:00		Lunch

Chair: László Kövér

14:00 - 14:40	Takaharu Nagatomi	SURFACE EXCITATION PARAMETER AND INELASTIC MEAN FREE PATH IN AU FOR 300 TO 3000 EV ELECTRONS
14:40 - 15:10	György Gergely	QUANTIFICATION OF ELASTIC PEAK ELECTRON SPECTROSCOPY (EPES) FOR SURFACE EXCITATION CORRECTION OF THE INELASTIC MEAN FREE PATH (IMFP)
15:10 - 15:40		Discussion with refreshments

Chair: Aleksander Jablonski

15:40 - 16:00	Nicolas Pauly	Surface excitation parameter: Theoretical determination and application in Monte Carlo simulations
16:00 - 16:40	Maarten Vos	Electron Scattering at high Energies
16:40 - 17:00	Viktor Afanas`ev	Inelastic Cross-sections of Nb for electron energy 5-40 keV
17:00 - 17:40	Francesc Salvat	Cross sections for ionization of inner shells by electron impact

Tuesday

Chair: Miklós Menyhárd

9:00 - 9:40	Josef Zemek	ELECTRON TRANSPORT UNDER NON-IDEAL SURFACE TOPOGRAPHY
9:40 - 10:20	László Kövér	Electron spectra excited by hard X-rays from solids: parameters characterizing electron transport phenomena
10:20 - 10:50	Discussion with refreshments	

Chair: Francese Salvat

10:50 - 11:30	Takashi Fujikawa	Quantum Theory Applied to Electron Transport of Photoelectrons
11:30 - 11:50	Hiroko ARAI	Theoretical Study of Multi-atom Resonant Photoemission
11:50 - 12:10	Hiroshi Shinotsuka	QUANTUM MECHANICAL DEPTH DISTRIBUTION FUNCTION CALCULATED BY MULTIPLE SCATTERING THEORY
12:10 - 14:00	Lunch	

Chair: Maarten Vos

14:00 - 14:40	Juana Gervasoni	PLASMON EXCITATIONS IN X-RAY INDUCED PHOTO AND AUGER ELECTRON EMISSION FROM NANOSYSTEMS.
14:40 - 15:20	A. Dubus	MONTE CARLO SIMULATIONS AND BOLTZMANN TRANSPORT EQUATION: TOOLS FOR QUANTIFICATION OF ELECTRON SPECTROSCOPES FOR SURFACE ANALYSIS
15:20 - 15:40	Ludomir Zommer	BACKSCATTERING FACTOR FOR COMPLEX STRUCTURES
15:40 - 16:10	Discussion with refreshments	

Chair: Wolfgang Werner

16:10 - 16:50	Sven Tougaard	3-Dimensional XPS Imaging of Surface Nano-structures; A New Technique
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16:50 - 17:10	Shaaker Hajati	Validity of Yubero-Tougaard theory to quantitatively determine the dielectric properties of surface nanofilms
17:10 - 17:30	Mihály Novák	Effects of interference and elastic scattering on electron transport in the near surface region of solids : simulations using different models
17:30 - 17:50	Francisco Yubero	Hydrogen quantification at surfaces by electron spectroscopy

Wednesday

Chair: Sven Tougaard

9:00 - 9:40	Zejun Ding	A Monte Carlo simulation of secondary electron excitation
9:40 - 10:00	Vladimir Stary	CONTRAST IN LOW-VOLTAGE ELECTRON MICROSCOPY - MONTE-CARLO SIMULATION AND AN EXPERIMENTAL MEASUREMENT
10:00 - 10:20	Mirosław Krawczyk	CALCULATED SEPs AND EFFECTIVE ELECTRON IMFPs FOR SELECTED III-V SEMICONDUCTOR COMPOUNDS
10:20 - 10:50	Discussion with refreshments	
10:50 - 11:10	F. Yubero - <u>A. Dubus</u>	Test of validity of the V-type approach for electron trajectories in REELS
11:10 - 11:30	Jiri Pavluch	Non-destructive depth profiling of activated Ti-Zr-V NEG by means of SRPES
11:30 - 11:45	Closing the Workshop	

Duration of all talks include the discussion as well.

40 minute talks include 8 minutes of discussion,

30 minute talks include 6 minutes of discussion,

20 minute talks include 4 minutes of discussion.

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