

13èmes Journées des Actinides

Elat 26-28 April 1983

ISRAEL

13JA

ימי האקטינידים ה-13

אילת י"ג-ט"ו באייר תשמ"ג

ישראל

13JA
Program
Abstracts
List of participants

Israel Atomic Energy Commission
Nuclear Research Centre - Negev



הוועדה לאנרגיה אטומית
קרית למחקר גרעיני - נגב

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Sponsors:

Ministry of Science and Development -
National Council for Research and Development

Israel Atomic Energy Commission

Nuclear Research Centre - Negev

Organizing Committee:

Joseph GAL, Moshe KUZNIETZ, and Micha J. DAPHT



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PREFACE

It is now well established that the interpretation of the actinides behaviour contributes directly to a better understanding of poorly explained phenomena in other parts of the periodic table, mostly in the lanthanide and transition-element series.

The "Journées des Actinides" (JA) meeting has gained its scientific importance by presenting the "state of the art" in the actinide research programs.

Growing number of scientists from different research areas and disciplines, from all over the world, participate actively and contribute to the success of the present conference. 74 participants in the Conference contribute a total of 50 communications. Traditionally we encourage post-deadline contributions which reflect the latest developments in the field, knowing that contributions of this type are preliminary and in their early stage. In continuation to the "12èmes Journées des Actinides" held at Orsay, France, no plenary invited lectures are included in the present Conference. Instead more time is devoted to comments and discussions, preserving the informal character of the JA. One poster session will take place, where we hope that direct relations and personal contacts among participants will result in fruitful discussions.

The "13èmes Journées des Actinides" are sponsored by the Ministry of Science and Development - National Council for Research and Development of Israel and by the Israel Atomic Energy Commission, and supported by the Nuclear Research Centre - Negev (NRCN). Special thanks are due to Mr Abraham SEROUSSI, Director of the NRCN, for his encouragement, which highly contributed to the success of the present JA. We thank the Administration Division, the Instruction and Education Department, and the Publishing Department of the NRCN, for their efforts and help.

We thank the management of the Caesar Hotel in Elat, for their care and hospitality during the Conference, and *Conventions (Kopel tours) Ltd*, for their assistance.

We wish all participants successful and fruitful "Journées des Actinides" and a pleasant stay in Elat and in Israel.

Joseph GAL



13èmes Journées des Actinides, Elat, ISRAEL, 26-28 April 1983

P R O G R A M

Monday, 25 April 1983

- 1500-1930 Registration
1930-2000 Welcome cocktail
2000-2100 Dinner
2100-2200 Registration (cont.)
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Tuesday, 26 April 1983

- 0900-0930 Opening session
Chairperson: J. GAL
Welcome address: Uzi EILAM, Director General
Israel Atomic Energy Commission
Welcome address: Abraham SEROUSSI, Director
Nuclear Research Centre - Negev
- 0930-1030 Session A: Theoretical aspects
Chairperson: J. SCHOENES
- 0930-0945 A1 *AB INITIO* CALCULATION OF URANIUM PARTITION FUNCTIONS
J. M. MACK, L. J. RADZIEMSKI, G. I. KERLEY, and W. M. SPARKS
- 0945-1000 A2 RECENT APPLICATIONS OF THE RELATIVISTICALLY PARAMETRIZED EXTENDED
HÜCKEL METHOD (REX) ON ACTINIDE COMPOUNDS
P. PYYKKÖ
- 1000-1015 A3 CALCULATION OF THE CRYSTAL FIELD PARAMETERS OF THE U^{4+} ION IN UCl_4
Z. ŻOŁNIEREK and Z. GAJEK
- 1015-1030 A4 CERUMLIKE BEHAVIOR OF PLUTONIUM
B. R. COOPER
- 1030-1100 Coffee break
- 1100-1200 Session B: Magnetic properties
Chairperson: B. R. COOPER
- 1100-1115 B1 MAGNETISM OF CALIFORNIUM METAL
P. G. HURAY, S. E. NAVE, and R. G. HAIRE
- 1115-1130 B2 MAGNETIC PROPERTIES OF PuAs, PuSb, AND PuBi SINGLE CRYSTALS
J. C. SPIRLET, J. REBIZANT, and O. VOGT
- 1130-1145 B3 VALENCE TRANSITION OF URANIUM IN (U,Y)Sb
B. FRICK, J. SCHOENES, F. HULLIGER, and O. VOGT
- 1145-1200 B4 COMPOSITION-DEPENDENT MAGNETIC PROPERTIES OF $NpCo_{2\pm x}$ LAVES-PHASE
COMPOUNDS: MÖSSBAUER AND X-RAY DIFFRACTION STUDIES
J. GAL, M. KUZNIETZ, S. FREDO, W. POTZEL, L. ASCH, and G. M. KALVIUS

1200-1300	Session C: Neutron diffraction Chairperson: R. GUILLAUMONT	1715-
1200-1215	C1 $^{239}\text{PuD}_{2.25}$ NEUTRON POWDER DIFFRACTION STUDY W. BARTSCHER, A. BOEUF, R. CACIUFFO, J. M. FOURNIER, L. MANES J. REBIZANT, <u>F. RUSTICHELLI</u> , and J. W. WARD	1715-
1215-1230	C2 NEUTRON DIFFRACTION STUDY OF THE MAGNETIC ORDERING IN PLUTONIUM MONOPNICTIDES PuAs AND PuSb P. BURLET, S. QUEZEL, <u>J. ROSSAT-MIGNOD</u> , O. VOGT, J. C. SPIRLET, and J. REBIZANT	1730- 1745-
1230-1245	C3 MAGNETIC PROPERTIES OF NpM_4Al_8 INTERMETALLIC COMPOUNDS (M = Cr, Cu) STUDIED BY MÖSSBAUER EFFECT, MAGNETIC SUSCEPTIBILITY, AND NEUTRON DIFFRACTION <u>J. GAL</u> , M. KUZNIETZ, S. FREDO, M. MELAMUD, H. PINTO, H. SHAKED, W. POTZEL, L. ASCH, and G. M. KALVIUS	1800- 1900-
1245-1300	C4 NEUTRON INTERFEROMETRIC DETERMINATION OF THE COHERENT SCATTERING LENGTH OF THORIUM A. BOEUF, R. CACIUFFO, <u>F. RUSTICHELLI</u> , J. M. FOURNIER, V. KISCHKO, and L. MANES	2100-
1300-1430	Lunch	Medine
1500-1545	Session D: Organometallic compounds Chairperson: G. BOMBIERI	
1500-1515	D1 PREPARATION AND PROPERTIES OF SOME NEW ORGANOMETALLIC COMPOUNDS OF ACTINIDES J. GOFFART	0830- 0830-
1515-1530	D2 REACTIVITY OF $\text{M}(\text{NET}_2)_4$ TOWARDS CYCLOPENTADIENE: SYNTHESIS, CHARAC- TERIZATION AND REACTIVITY OF SOME $\text{MCp}_n(\text{NET}_2)_{4-n}$ (M = U(IV) AND Th(IV)) <u>G. PAOLUCCI</u> , P. ZANELLA, G. ROSSETTO, and R. D. FISCHER	0845-
1530-1545	D3 PSEUDOTETRAHEDRAL VERSUS RELATED TRIGONAL BIPYRAMIDAL ORGANOURANIUM (IV)-COMPLEXES: INTERRELATIONS OF MOLECULAR AND ELECTRONIC STRUCTURE <u>R. D. FISCHER</u> , K. YÜNLÜ, W. JAHN, H.-D. AMBERGER, and B. KANELLAKOPULOS	0900- 0915-
1545-1645	Session E: Solution chemistry Chairperson: C. MUSIKAS	
1545-1600	E1 LIMIT DIFFUSION COEFFICIENTS AND HYDRATION (NUMBERS) OF SOME TRIVALENT ACTINIDE AND LANTHANIDE IONS <u>B. FOUREST</u> , J. DUPLESSIS, and F. DAVID	0945-
1600-1615	E2 BOROHYDRURES D'URANIUM III ET IV EN SOLUTION. APPLICATION A LA SYNTHESE DE NOUVEAUX COMPOSES D'URANIUM B. BAN, A. DEJEAN-MEYER, V. FAZAKERLEY, G. FOLCHER, and <u>H. MAROUE-ELLIS</u>	1015- 1600-
1615-1630	E3 RADIOCHEMICAL MEASUREMENTS OF SURFACE CORROSION INFLUENCED BY α -EMITTES <u>W. ERBEN</u> , A. BESTANPOURI, G. MARX, J. NAEGELE, and W. MÜLLER	1630-
1630-1645	E4 TRANSPORT PROCESSES OF ACTINIDES IN AQUEOUS AND NONAQUEOUS SOLUTIONS G. MARX, F. ARNDT, C. BINDER, H. BISCHOFF, <u>K.-H. FELDNER</u> , V. FRIEHMELT, and B. RÖSEL	
1645-1715	Coffee break	

- 1715-1815 Session F: Solid state chemistry and diffusion
Chairperson: M. PAGES
- 1715-1730 F1 STRUCTURAL CHEMISTRY OF THORIUM COMPOUNDS WITH COORDINATION NUMBERS
7, 8, 9, AND 10
G. BOMBIERI, F. BENETOLLO, G. TOMAT, and A. DEL PRA
- 1730-1745 F2 URANIUM MOBILITY IN THE SOLID STATE: THE FIRST STEP
H. NOEL
- 1745-1800 F3 THE MORPHOLOGY OF THE REACTION OF URANIUM WITH HYDROGEN
J. BLOCH, F. SIMCA, M. KROUPP, A. STERN, D. SHMARJAHU, Z. HADARI, and
M. H. MINTZ
- 1800-1815 F4 CRYSTAL GROWTH OF PLUTONIUM MONOPnictIDES
J. REBIZANT, C. RIJKEBOER, J. C. SPIRLET, K. MATTENBERGER, and O. VOGT
- 1900-2030 Dinner
- 2100- Lecture on Marine Flora and Tropical Fish in the Gulf of Elat
Social meeting at the swimming pool

Wednesday, 27 April 1983

- 0830-0945 Session G: Structure at high pressure
Chairperson: W. MÜLLER
- 0830-0845 G1 X-RAY DIFFRACTION STUDY OF CALIFORNIUM METAL TO 16 GPa
J. R. PETERSON, U. BENEDICT, C. DUFOUR, I. BIRKEL, and R. G. HAIRE
- 0845-0900 G2 HIGH PRESSURE X-RAY DIFFRACTION STUDY OF ACTINIDE COMPOUNDS: THORIUM
DIOXIDE AND THORIUM MONOSULFIDE
U. BENEDICT, C. DUFOUR, J. C. SPIRLET, J. STAUN OLSEN, and L. GERWARD
- 0900-0915 G3 X-RAY DIFFRACTION STUDY OF $NpAl_2$ AT HIGH PRESSURE
J. ZÄNKERT, W. POTZEL, J. MOSER, M. WUNSCH, T. OBENHUBER,
G. M. KALVIUS, and J. GAL
- 0915-0945 G4 REPORT ON THE WORKSHOP "ACTINIDES UNDER PRESSURE", KARLSRUHE,
APRIL 21-22, 1983
U. BENEDICT
- 0945-1015 Coffee
- 1015-1600 Recreation; visit to the underwater observatory; lunch (1300-1430)
- 1600-1630 Coffee
- 1630-1900 Session H: Poster presentation
- H1 CRYSTAL FIELD MODELS FOR THE INTERPRETATION OF THE MAGNETIC
PROPERTIES OF SOME U AND Np TETRAGONAL COMPOUNDS
G. AMORETTI, A. BLAISE, and J. M. FOURNIER
- H2 NEUTRON DIFFRACTION STUDY OF $U_{0.5}Np_{0.5}O_2$
A. TABUTEAU, M. PAGES, R. CACIUFFO, L. MANES, and J. REBIZANT
- H3 EPR STUDIES OF U^{4+} DOPED ThO_2 SINGLE CRYSTALS
D. C. GIORI, G. CALESTANI, and G. AMORETTI

1630-1900	Session H: Poster presentation (cont.)	0900-0
H4	CRYSTAL STRUCTURE AND ELECTRICAL RESISTIVITY OF SOME NEPTUNIUM TERNARY COMPOUNDS NpAsY (Y = S, Se, Te) A. WOJAKOWSKI	0915-0
H5	SYNTHESIS AND MÖSSBAUER STUDIES OF CARNOTITE-TYPE COMPOUNDS $M_2(NpO_2)_2V_2O_8$ (M = K, Rb, Tl) H. X. YANG, A. TABUTEAU, <u>J. JOVE</u> , T. THEVENIN, and M. PAGES	0930-0 0945-1
H6	STRUCTURAL STUDY OF NEPTUNYL (NpO_2^+) COMPLEX WITH MELLITIC ACID <u>A. COUSSON</u> , F. NECTOUX, S. DABOS, and M. PAGES	1000-1
H7	NEW "TETRAGONAL AND HEXAGONAL TUNGSTEN BRONZE" TYPE PHASES WITH ACTINIDES IONS S. LAUNAY, M. R. LEE, and <u>W. FREUNDLICH</u>	1030-1
H8	DIFFUSION COUPLE STUDIES IN THE U-Ga AND Th-Ga SYSTEMS <u>D. DAYAN</u> , G. KIMMEL, and M. P. DARIEL	1030-1
H9	OXYDATION PAR L'EAU OXYGENEE PHOTOSENSIBILISEE PAR L'URANYLE <u>G. FOLCHER</u> , J. PARIS, and E. SAITO	1045-1
H10	INVESTIGATION OF THE AMMONIUM-URANYL-CARBONATE ROUTE FOR THE PRODUCTION OF SINTERED UO_2 PELLETS S. VAKNIN, <u>A. LORBER</u> , and M. HALACHMY	1100-1
H11	POTENTIOMETRIC INVESTIGATION OF URANYL(VI)- AND THORIUM(IV)- GLUTATHIONATE SYSTEMS <u>M. TASKAEVA</u> , A. BISMONDO, and L. RIZZO	1520-1 1600-1
H12	PYROCATECHOLATE COMPLEXING OF TRIVALENT ACTINIDES <u>R. LUNDOVIST</u> and A. STREZOV	1630
H13	THE RED FLUORESCENCE OF U^{4+} IN THE INCOMMENSURATE PHASE OF $ThCl_4$ <u>J. C. KRUPA</u> and C. KHAN MALEK	1730-1
H14	OPTICAL AND THERMODYNAMIC PROPERTIES OF URANIUM AT ELEVATED TEMPERATURE <u>J. M. MACK</u> and L. J. RADZIEMSKI	1900-1
H15	THE ENTROPIES OF THE GASEOUS ACTINIDE MO_2^{n+} IONS <u>Y. MARCUS</u> and A. LOEWENSCHUSS	
1730-1800	Light drinks	
2030-	Banquet; Israeli folklore show	

Thursday, 28 April 1983

0830-1000	Session J: Optical, Thermodynamic, and Transport properties Chairperson: L. MANES
0830-0845	J1 INFRARED AND RAMAN STUDIES OF PHONONS AND ELECTRONS IN Th_3P_4 AND Th_3As_4 <u>J. SCHOENES</u> , I. MOERKE, and M. KUENG
0845-0900	J2 5f-ELECTRONS IN URANIUM LAVES-PHASE COMPOUNDS: PHOTOEMISSION FROM UMn_2 , UFe_2 , UCo_2 , $UFeNi$, UOs_2 , AND UIr_2 <u>J. BRUNNER</u> , M. ERBUDAK, and F. HULLIGER

0900-0915 J3 HEAT CAPACITY OF UP-USE SOLID SOLUTIONS
J. E. GORDON, A. BLAISE, R. LANGIER, M. MORTIMER, and R. TROĆ

0915-0930 J4 LOW TEMPERATURE HEAT CAPACITY OF ROCKSALT URANIUM MONOPNICTIDES
R. TROĆ and H. MÁDGE

0930-0945 J5 TRANSPORT PROPERTIES OF U_{5b} AND U_{As} SINGLE CRYSTALS
J. SCHOENES, B. FRICK, and O. VOGT

0945-1000 J6 TRANSPORT PROPERTIES OF THE p-TYPE Th_3As_4
P. J. MARKOWSKI and Z. HENKIE

1000-1030 Coffee break

1030-1100 Session K: Identification
Chairperson: M. KUZNIETZ

1030-1045 K1 DETERMINATION OF PLUTONIUM AND URANIUM ISOTOPIC RATIOS IN AIR
FOR ENVIRONMENTAL MONITORING
H. SORANTIN

1045-1100 K2 NEUTRON YIELDS FROM URANIUM-FLUORINE COMPOUNDS
Y. BONEH, S. GOSHEN, Z. KARPAS, O. SHAHAL, and A. WOLF

1100-1530 Recreation and discussions; lunch (1300-1430)

~~1530~~-1600 Coffee

1600-1730 Closing session: Perspectives in actinides -
summary of the "13èmes Journées des Actinides"
1630 Chairperson: W. MÜLLER

1730-1900 Discussions

1900-2030 Dinner
