



J. J. J.
25/4/88.

18^{èmes} Journées des Actinides

April 20 - 22 1988

Paris

Organized by :

*UA 448 : "Physicochimie des Eléments Transuraniens"
Institut Curie, Section de Physique et Chimie*

*11 rue Pierre et Marie Curie
75231 PARIS Cedex 05*

"Le groupe des Transuraniens" is happy to welcome you to this annual forum dedicated to the physics and chemistry of the Actinides.

This event was originally a modest gathering of some physicists and chemists wishing a more fruitful collaboration. Today, it is a much sought after international meeting. 133 participants have registered to date, and 84 papers have been submitted. We hope that despite this large increase in participants, these Journées will retain their informality and high level of interaction.

We would like to thank "l'Agence Nationale pour la Gestion des Déchets Radioactifs" (ANDRA) and "Enraf-Nonius France" for their financial contribution to this event. Special thanks also to Françoise Nectoux, Jacques Proust and Thierry Thévenin for their efficient help in the organization of this Conference.

We wish all participants both a pleasant stay in Paris and an interesting and rewarding meeting.

Monique Pagès

April, 11, 1988

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LIST OF PARTICIPANTS	179

PROGRAM

Wednesday, April 20, 1988		Thursday, April 21, 1988		Friday, April 22, 1988	
		8.00	Registration (Cont'd)	8.45	Preparation Posters B
		9.00 - 9.15	Welcome Address	9.00 - 10.45	VII. Solid State Studies
		9.15 - 10.15	II. Electronic Structure	10.45 - 11.15	Coffee Break
		10.15 - 10.45	Coffee Break	11.15 - 12.30	VIII. Magnetic Properties
		10.45 - 12.15	III. Electronic Structure	12.30 - 13.30	Lunch
		12.15 - 13.30	Lunch	13.30 - 15.30	IX. Posters B
		13.30 - 15.00	IV. Posters A (Cont'd)	15.30 - 16.00	Coffee Break
		15.00 - 16.30	V. Solution and Analytical Chemistry	16.00 - 17.30	Summary and Perspectives
		16.30 - 17.00	Coffee Break	17.30 - 20.00	Free
		17.00 - 18.15	VI. Transport and Thermodynamic Properties		
		18.15 - 20.00	Free		
		20.00	Dinner	20.00	Farewell Party
16.00	Registration				
17.00 - 19.00	I. Posters A				
19.00 - 22.00	Welcome Party				

WEDNESDAY, APRIL 20, 1988

16.00 - 20.00 REGISTRATION

17.00 - 19.00 SESSION I : POSTERS A

(Electronic Structure, Thermodynamic Properties, Transport Properties, Solution Chemistry, Geochemical and Analytical Aspects)

1. Dilute U Alloys : Test Cases for 5f Electronic Structure.
F.U. HILLEBRECHT
2. Effects of Many-Body Forces in a Strongly Correlated Electron System.
R. LYZWA, J. LACH and J. JEDRZEJEWSKI
3. Relativistic Calculations on Actinoid Compounds.
P. PYYKKÖ
4. Regularities in Physical-Chemical Properties of the Actinyl Ions.
G.V. IONOVA, V.G. PERSHINA and N.I. SURAEVA
5. The Electronic Structure of NpO_2^+ , NpO_2^{2+} and NpO_2^{3+} .
G.V. IONOVA, V.G. PERSHINA and N.I. SURAEVA
6. Valency of Plutonium in Metallic and Intermetallic Compounds.
G.V. IONOVA, V.G. PERSHINA and V.I. SPITSYN
7. The Ratios of the Nephelauxetic Changes of the Racah Parameters and the Spin-Orbital Constant for f Electrons.
V.G. VOKHMIM and G.V. IONOVA
8. The Theoretical Ratios of the Parameters of the f Electron Electrostatic Interaction.
V.G. VOKHMIM and G.V. IONOVA
9. Thermodynamics of some Lanthanide and Actinide Complex Oxides. Enthalpy of Formation of $\text{Ba}(\text{Ce}, \text{Pr}, \text{Tb}, \text{Am})\text{O}_3$, $\text{Sr}(\text{Ce}, \text{Pr}, \text{Tb})\text{O}_3$ and $(\text{Ba}, \text{Sr})\text{NpO}_4$.
J. GOUDIAKAS, B. GILBERT and J. FUGER
- X 10. On the Interaction of Sodium with Hypostoichiometric Uranium-50% Americium Mixed Oxides.
K. MAYER, L. KOCH, J. NAEGELE and K. RICHTER

Sand
U O₂

11. **Electrical Resistivity of UP under Uniaxial Stress.**
*H. BARTHOLIN, C. BREANDON, R. TCHAPOUTIAN,
J.M. FOURNIER, J. SCHOENES and O. VOGT*
12. **Electrical Resistivity of NpTe.**
*E. PLESKA, J.M. FOURNIER, J. CHIAPUSIO,
J. ROSSAT-MIGNOD, J.C. SPIRLET, J. REBIZANT and O. VOGT*
13. **Electrical Resistivities of the UT(Si, Ge) phases.**
R. TROC and T. VINH-HUNG
14. **Speciation of Neptunium in Concentrated Nitric Acid. Absorption Spectra of Np(IV), Np(V) and Np(VI).**
C. APOSTOLIDIS, H. BOKELUND and M. OUGIER
15. **Hypochlorite Complexation of Pu(VI) Under Alpha-Radiolysis in Saline Solution.**
K. BÜPPELMANN, J.I. KIM and I. PASHALIDIS
16. **A Simple, Performant, Modular Spectrophotometer for Glove-Box Operations.**
M.S. CACECI
17. **Extraction of Actinides and Inorganic Acids by N,N-Dialkylamides.**
N. CONDAMINES and C. MUSIKAS
18. **Malonamides as New Extractants of Actinides.**
C. CUILLERDIER, C. MUSIKAS and P. HOEL
19. **Electromigration of Am and Cf in Aqueous Solution.**
B. FOUREST, E. HALTIER and F. DAVID
20. **The Use of the AKUFVE - LISOL Technique for Studying Actinide Complexation.**
J. RYDBERG and Y. ALBINSSON
21. **Photocatalytic Properties of Uranyl Compounds. ESR Evidence of Free Radicals in the Photooxidation of Olefins with Uranyl Acetate.**
S. Di MARTINO, S. SOSTERO and O. TRAVERSO
22. **α -Decays of ^{221}Fr ($T_{1/2} = 4.8\text{m}$) and ^{213}Bi (45.6m).**
*M.C. KOUASSI, H. MARIA, J. DALMASSO, A. HACHEM
and G. ARDISSON*
23. **α -Decay of ^{218}At and the Levels of ^{214}Bi .**
*G. MOUZE, O. DIALLO, J.F. COMANDUCCI, P. BECHLITCH and
C. YTHIER*

24. **Study of Humate Complexation and Humic Colloid Generation of Am(III) by Laser-Induced Photoacoustic Spectroscopy.**
R. KLENZE, E. BRYANT and J.I. KIM
25. **Détermination Rapide par Spectrométrie du Rapport Plutonium 238 / Plutonium 239 dans des Solutions de Combustibles Irradiés en Utilisant la Technique de la Bille de Résine Couplée à l'Evaporation Laser ou l'Electrodéposition.**
B. JOUNIAUX
26. **Direct Trace Determination of Some Actinides by Laser-Induced Fluorescence.**
P. DECAMBOX, P. MAUCHIEN and C. MOULIN

19.00 - 22.00

WELCOME PARTY

THURSDAY, APRIL 21, 1988

8.00 REGISTRATION (continued)

9.00 - 9.15 WELCOME ADDRESS : M. PAGES

9.15 - 10.15 SESSION II : ELECTRONIC STRUCTURE

Chairperson : A. BLAISE

1. Surface Electronic Behavior of Plutonium.
B.R. COOPER and YOU-GONG HAO
2. Metamagnetism in UCoAl.
O. ERIKSSON, B. JOHANSSON and M.S.S. BROOKS
3. Photoemission Investigation of 5f Electron Localization in
Am_xPu_{1-x} Binary Alloys.
J. NAEGELE and J.C. SPIRLET
4. Optical and Magneto-Optical Properties of Ferromagnetic UCuAs₂
and UCu₂P₂ Single Crystals
P. FUMAGALLI, J. SCHOENES and D. KACZOROWSKI

10.15 - 10.45 COFFEE BREAK

10.45 - 12.15 SESSION III : ELECTRONIC STRUCTURE

Chairperson : G.H. LANDER

- 10⁵⁰
1. Low Temperature Heat Capacity of PuSb.
R.O.A. HALL, M.J. MORTIMER and J.C. SPIRLET.
 2. Many-Body Effects in L_{III} X-Ray Absorption Spectra of
Neptunium Compounds.
G. KAINDL, S. BERTRAM, J. JOVE and M. PAGES

3. Diffusion Inélastique des Neutrons par Temps de Vol sur $M(NCS)_8 [N(C_2H_5)_4]_4$ où $M = Th, U$.
E. SOULIE et G. CODDENS
4. Localization of 5f States in Various Uranium and Thorium Crystalline and Amorphous Compounds Studied by L and M-Edge X-Ray Absorption Spectroscopy.
D. PETIT-MAIRE, J. PETIAU and G. CALAS
5. Local and Bulk Susceptibilities of Np Intermetallic in Their Paramagnetic State.
J. GAL, S. FREDO, S. TAPUCHI, J. JOVE, A. COUSSON, T. THEVENIN, M. PAGES, F.J. LITTERST, W. POTZEL, J. MOSER, U. POTZEL and G.M. KALVIUS
6. Defect Structure in Substoichiometric Actinide Mixed Oxide $(U,Pu)O_{2-x}$.
M. BEAUVY

12.15 - 13.30 LUNCH

13.30 - 15.00 SESSION IV : POSTERS A (continued)

15.00 - 16.30 SESSION V : SOLUTION and ANALYTICAL CHEMISTRY

Chairperson : J.I. KIM

1. Americium Carbonate Complexation Study by Remote Fiber Optic Spectrophotometry.
H. NITSCHÉ, E.M. STANDIFER and R.J. SILVA
2. Study of Cation-Cation Complexes of Np(V) by Absorption Spectrophotometry.
B.E. STOUT, M. PAGES and G.R. CHOPPIN
3. Actinide Dioxide Dissolution in Acidic Media : Study of the Mechanism by Carbon Paste Electrochemistry and ^{18}O Labelling.
P. BERGER, C. MADIC and J. LIVET
4. Kinetics of the Dissolution of Plutonium Dioxide in Acidic Media by Cr(II) Reducing Agent.
X. MACHURON - MANDARD and C. MADIC

5. **Sensitive Detection of Uranium and Plutonium by Resonance Ionization Mass Spectrometry.**
N. TRAUTMANN, G. HERRMANN, M. MANG, C. MÜHLECK, H. RIMKE, P. SATTELBERGER, F. AMES, H.J. KLUGE, E.W. OTTEN, D. REHKLAU and W. RUSTER
6. **Sorption Behaviour of Am(III) on SiO₂ Amorphous Colloid.**
C. DEGUELDRE, W. GOERLICH and B. WERNLI

16.30 - 17.00

COFFEE BREAK

17.00 - 18.15

SESSION VI : TRANSPORT AND THERMODYNAMIC PROPERTIES

Chairperson : O. VOGT

1. **Anomalous Transport Properties in UAsSe and ThAsSe.**
J. SCHOENES, W. BACSA, F. HULLIGER and H.U. NISSEN
2. **Immersion of Metal and Alloy Foils in Liquid Uranium and its Alloys up to 1350°C.**
M. KUZNIETZ
3. **High Pressure Transport Properties in UBe₁₃.**
S.Y. MAO, D. JACCARD and J. SIERRO
4. **High Temperature Studies of Transplutonium Alloys and Fluorides.**
R.G. HAIRE and J.K. GIBSON
5. **Ionization and Fragment Ion Appearance Potentials of the Molecules PuF₆, PuF₅, PuF₄ and PuF₃.**
P.D. KLEINSCHMIDT

20.00

CONFERENCE DINNER

07³⁰ BRC

FRIDAY, APRIL 22, 1988

8.45 PREPARATION POSTERS B

9.00 - 10.45 SESSION VII : SOLID STATE STUDIES

Chairperson : C. KELLER

1. General Diagram of the Phase Relations of Actinide Metals under Pressure.
U. BENEDICT
2. Phase Transformation of NpSb under High Pressure
S. DABOS-SEIGNON, U. BENEDICT, S. HEATHMAN
and J.C. SPIRLET
3. Absorption and Raman Spectrophotometric Studies of Actinides Compounds.
W.R. WILMARTH, J.P. YOUNG, R.G. HAIRE, G.M. BEGUN
and J.R. PETERSON
4. Synthesis and Oxygen Content of $^{248}\text{CmO}_{2-x}$ Prepared by Hydrolytic Disproportionation.
L.R. MORSS and C.W. WILLIAMS
5. Local Structure Around Actinides in Borosilicate Glasses of Nuclear Interest Using EXAFS.
D. PETIT-MAIRE, J. PETIAU, G. CALAS,
N. JACQUET-FRANCILLON and C. FILLET
6. Structural Chemistry of Th(IV) Thiocyanates Urea and Amide Ligands.
E. FORSELLINI, G. BOMBIERI and F. BENETOLLO
7. Structure of Indenyl Complexes of Actinides.
J. GOFFART and S. BETTONVILLE

10.45 - 11.15 COFFEE BREAK

11.15 - 12.30

SESSION VIII : MAGNETIC PROPERTIES

Chairperson : W. SUSKI

1. **Muon Spin Rotation and Relaxation in Uranium Monopnictides.**
*L. ASCH, F.J. LITTERST, G.M. KALVIUS, A. KRATZER,
K. AGGARWAL, W. POTZEL, A. SCHENCK, F. GYGAX, S. BARTH,
K. MATTENBERGER and O. VOGT*
2. **Magnetic Excitations in $U(Pd_{1-x}Pt_x)_3$.**
*K.A. McEWEN, W.G. STIRLING, C.K. LOONG, G.H. LANDER
and D. FORT*
3. **^{237}Np Mössbauer Study of the Intermetallic Compound $NpRh_2Si_2$.**
J.P. SANCHEZ, R. POINSOT, J. REBIZANT and J.C. SPIRLET
4. **Magnetic Properties and Hybridization Effects in UTX Compounds.**
*V. SECHOVSKY, L. HAVELA, F.R. de BOER, P.A. VEENHUIZEN
and E. BRÜCK*
5. **Magnetic Structure and Form Factor of Pu^{3+} in Pu_2O_3 .**
M. WULFF, G.H. LANDER and A. HEWAT

12.30 - 13.30

LUNCH

13.30 - 15.30

SESSION IX : POSTERS B

(Solid State Studies, Growth of Single Crystals, Organometallic Compounds, Magnetic Properties, Heavy Fermions, Optical Properties)

- send UCL4*
1. **Tervalent Uranium Chloro and Bromo Complexes**
J. DROZDZYNSKI and E. ZYCH *Single Crystals*
 2. **Synthèse en Monocristaux et Structures de Boro Uranates.**
M. GASPERIN
 3. **Ionic Speciation of Np in Frozen Solutions.**
*L. HE, J. JOVE, J. PROUST, M. PAGES, C. MADIC,
J. de SANOIT and J. LITTERST*
 4. **Derived Perovskite-Like Compounds, Containing Neptunium, Related to High T_C Superconductors ($YBa_2Cu_3O_{7-x}$, La_2CuO_4 , Ba_2MCuO_6).**
*L. HF, A. COUSSON, J. JOVE, A. TABUTEAU, J. PROUST
and M. PAGES*

5. **Effect of Liquid Uranium on Tungsten Foils up to 1350°C.**
M. KUZNIETZ, Z. LIVNE, C. COTLER and G. EREZ
6. **Crystal Structure of $\text{U}(\text{H}_2\text{PO}_2)_3 \cdot \text{H}_2\text{O}$.**
P.A. TANNER, J.P. SILVESTRE and NGUYEN QUY DAO
7. **Synthesis and Characterization of New Intermetallic Compounds.**
F. WASTIN, J. REBIZANT, J.C. SPIRLET, J. FUGER
and J. GOFFART
8. **Single Crystal Growth of Actinide Monopnictides and Monochalcogenides.**
J.C. SPIRLET, J. REBIZANT, C. RIJKEBOER, J. PETERSON
and O. VOGT
9. **Synthesis and Investigation of Bis (Pentamethylcyclopentadienyl) Neptunium(IV) Dichloride, $\text{Np}(\text{C}_5\text{Me}_5)_2\text{Cl}_2$: Evidence for Np-Np Magnetic Interaction.**
C. APOSTOLIDIS, B. KANELLAKOPULOS, J. MÜLLER
and B. POWIETZKA
10. **Synthesis, Crystal Structures and Ligand Exchange Reactions of Some Heptacoordinated Acetylacetonate Uranium(IV) Complexes.**
C. BAUDIN, P. CHARPIN, M. EPHRITIKHINE, M. LANCE,
M. NIERLICH and J. VIGNER
11. **The Chemistry of Uranium. Crystal Structure of the Isomorphous Pair $[\text{UX}_2\text{L}_4][\text{Ph}_4\text{B}]_2$ (X = Br, I ; L = $\text{OP}(\text{NC}_4\text{H}_9)_3$).**
J.G.H. du PREEZ, B. ZEELIE, U. CASELLATO
and R. GRAZIANI.
12. **Reactivity of Cp_2UX_2 Systems : Formation and Structural Characterization of an Oxygen Bridged Cluster Containing Both Inorganic and Organometallic Uranium(IV).**
N. BRIANESE, U. CASELLATO, F. OSSOLA, M. PORCHIA,
G. ROSSETTO and P. ZANELLA
13. **Crystal Structure of Bis(Tetraethylammonium) Hexanitrate Uranium : a Twelve Coordinated Uranium(IV) Complex.**
J. REBIZANT, C. APOSTOLIDIS, M.R. SPIRLET,
G.D. ANDRETTI and B. KANELLAKOPULOS
14. **Crystal Field Neutron Spectroscopy in UOS.**
G. AMORETTI, A. BLAISE, J.M. FOURNIER, R. CACIUFFO,
J. LARROQUE, R. OSBORN, A.D. TAYLOR and Z. BOWDEN
15. **Magnetic Behavior of NpSe from Np-Mössbauer Spectroscopy.**
M. BOGE, D. BONNISSEAU, L. ASCH, G.M. KALVIUS,
J.C. SPIRLET AND J. REBIZANT

16. **High Field Magnetization Studies of New Ternary Uranium Intermetallics.**
*V. SECHOVSKY, L. HAVELA, F.R. de BOER,
P.A. VEENHUIZEN, A.V. ANDREEV and K.H.J. BUSCHOW*
17. **Magnetism and Structural Chemistry of Uranium Nickel Aluminides and Gallides.**
K. HIEBL, R. ROGL, Yu.N. GRIN and H. NOEL
18. **Magnetization Measurements on a NpRu₂Si₂ Single Crystal.**
*E. PLESKA, J.M. FOURNIER, J. ROSSAT-MIGNOD,
J.C. SPIRLET and J. REBIZANT*
19. **Magnetic Structures of UCu_{4.5}Al_{7.5}, (U, Th)Fe₄Al₈ and UFe₆Al₆ Compounds.**
*B. PTASIEWICZ-BAK, A. BARAN, W. SUSKI
and J. LECIEJEWICZ*
20. **Magnetic and Transport Properties of the UTIn Phases.**
R. TROC and T. VINH-HUNG
21. **UPdIn - A New Magnetic Heavy-Fermion Compound.**
E. BRÜCK, F R. de BOER, V. SECHOVSKY and L. HAVELA
22. **Interpretation of the Optical, Magneto-optical and Magnetochemical Properties of Tetra(η^5 -Methylcyclopentadienyl) Uranium(IV) on the Basis of Crystal Field Theory.**
H.D. AMBERGER, J. FÖRSTER and H. REDDMANN
23. **Effects of Melting Temperature on the Oxidation State of the Actinides in Borosilicate Glass.**
M. BEAUVY, J. LARROQUE and P. GIANI
24. **High Pressure Optical Studies of Uranium and Thorium Compounds UAs, UP and ThAs.**
H. LUO, K. SYASSEN, U. BENEDICT and O. VOGT
25. **Lifetime Spectroscopy of U⁴⁺ Energy Levels in the Incommensurate Phase of β -ThBr₄ and β -ThCl₄.**
A. MILICIC, J.C. KRUPA, P. DELAMOYE and M. GENET

15.30 - 16.00

COFFEE BREAK

16.00 - 17.30

CONFERENCE SUMMARY AND PERSPECTIVES

Chairpersons * : J. FUGER, J. ROSSAT-MIGNOD

Speakers * : B.R. COOPER, J.M. FOURNIER, G. HERRMANN,
G.M. KALVIUS, L. MORSS, P. WATCHER

* : Not yet confirmed

20.00

FAREWELL PARTY

SATURDAY, APRIL 23, 1988

VISITS :

Laboratoire Curie : Groupe des Transuraniens

Musée Pierre et Marie Curie

84 papers

int: 10 }
collab: 8 }

↳ PuSb Hall
NpSe & NpTe resistivity.
NpRu₂Si₂ low T.

witng.
↓
19 May. / 3 June
23 June