

Program

**Alternative Materials
for
Radioactive Waste Stabilization
and
Nuclear Materials Containment**

25-29 March 2007

Il Ciocco Hotel and Conference Center, Barga, Italy

Conference Chair

Dr. Arun S. Wagh

Argonne National Laboratory

Conference Co-Chairs

Prof. Linn Hobbs

Massachusetts Institute of Technology, USA

Dr. John Marra

Savannah River National Laboratory, USA

Dr. M. David Maloney

CH2M Hill Company, USA

Dr. Vladimir Yuferev

Federal Nuclear Research Center, VNIIEF, Sarov, Russia

ECI

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Sunday, March 25, 2007

17:00 – 18:30	Registration
18:30 – 20:00	Opening Reception
20:00 – 21:30	Opening Dinner

Notes

- **Please observe “No Smoking” at ECI technical sessions, meals and social hours.**
- **Speakers should allow time at the end of their presentation for questions and discussion.**
- **Please silence your cell phone during technical sessions.**
- **All cameras, camera phones, audio, video and other recording devices are prohibited from technical sessions and poster sessions.**
- **Sign-up for the optional excursion to Lucca at the Il Ciocco registration desk. Payment is in cash.**

Monday, March 26, 2007

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 12:30 **Session I – Policy and Processes**
Session Chair: Arun Wagh
- 08:30 – 08:45 Opening remarks:
Arun Wagh, Conference Chair
Jules Routbort, ECF Liaison
- 08:45 – 09:45 I-1 John Marra, USA
ALTERNATIVE MATERIALS FOR RADIOACTIVE WASTE
STABILIZATION AND NUCLEAR MATERIALS CONTAINMENT
– A US DOE PERSPECTIVE
- 09:45 – 10:15 I-2 Véronique Fouchard, France
AREVA NC LA HAGUE PROCESSING PLANT SPENT RESINS
CEMENTATION UNIT
- 10:15 – 10:45 Coffee Break
- 10:45 – 11:15 I-3 C.R. Scales, UK
PROGRESS IN THE DEVELOPMENT OF ALTERNATIVE
WASTEFORMS FOR UK CLEAN UP
- 11:15 – 11:45 I-4 Dennis Kelley
CHINA'S SCIENTIFIC INVESTIGATION FOR LIQUID WASTE
TREATMENT SOLUTIONS
- 11:45 – 12:15 I-5 Florence Bart, France
DEVELOPMENT OF CERAMIC MATRICES FOR SEPARATED
LONG-LIVED FISSION PRODUCTS
- 12:30 – 14:00 Lunch
- 14:00 – 17:00 Free Time for leisure, recreation, *ad hoc* sessions
- 17:00 – 17:30 Afternoon Coffee
- 17:30 – 20:00 **Session II – Theory and Testing**
Session Chair: David Maloney
- 17:30 – 18:00 II-1 Arun Wagh, USA
THEORETICAL BASIS FOR CONTAMINANT IMMOBILIZATION
AND WASTE ENCAPSULATION
- 18:00 – 18:30 II-2 Alexandra Navrotsky, USA
THERMODYNAMICS OF CERAMIC WASTE FORMS

Monday, March 26, 2007 (continued)

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| 18:30 – 19:00 | II-3 Karin Popa, EU
SOLUBILITY OF PU IN MONAZITE-BRABANTITE SOLID SOLUTIONS |
| 19:00 – 19:30 | II-4 Linn Hobbs, USA
INCIPIENT DECOMPOSITION OF AMORPHIZINGCRYSTALLINE NUCLEAR WASTE FORMS |
| 19:30 – 20:00 | II-5 Seung Young Jeong, South Korea
DISSOLUTION RATE COMPARISON BETWEEN MODIFIED MCC-1 AND FLOW-THROUGH TESTS |
| 20:00 – 21:30 | Dinner |
| 21:30 – 23:00 | Poster Session with Social Hour |

Tuesday, March 27, 2007

07:30 – 08:30	Breakfast Buffet
08:30 – 12:30	<u>Session III – Cements, Geopolymers and Polymers</u> Session Chair: John Marra
08:30 – 09:00	III-1 John L. Provis, Australia GEPOLYMER BINDERS: TAILORING NANOSTRUCTURE AND MICROSTRUCTURE
09:00 – 09:30	III-2 Lorenzo Costa, Italy LIQUID WASTE PROCESSING WITH INNOVATIVE SOL-GEL CHEMISTRY
09:30 – 10:00	III-3 Neil B. Milestone, UK ACTIVATION OF SLAG AND SLAG/PFA COMPOSITE BY NEUTRAL SULPHATE SALTS: - A POTENTIAL ALTERNATIVE APPROACH FOR ENCAPSULATING NUCLEAR WASTES
10:00 – 10:30	Coffee Break
10:30 – 11:00	III-4 Dan Perera, Australia FEASIBILITY OF INCORPORATING CATIONS AND ANIONS EXPECTED IN RADIOACTIVE WASTE STREAMS IN METAKAOLIN-BASED GEPOLYMERS
11:00 – 11:30	III-5 Dileep Singh, USA FEASIBILITY STUDY ON A COMMERCIAL RIGID POLYURETHANE FOAM USED FOR FILLING OF PROCESS GAS EQUIPMENT AT K-25/K-27 PLANTS
12:30 – 13:30	Lunch
13:30 – 18:30	Optional Excursion to Lucca
20:00 – 21:30	Dinner
21:30 – 23:00	Poster Session with Social Hour

Wednesday, March 28, 2007

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 12:30 **Session IV – Phosphate Cements**
- 08:30 – 09:00 IV-1 David Maloney, USA
TEST METHOD AND PERFORMANCE REQUIREMENTS FOR ALTERNATIVE CERAMIC WASTE FORMS: A CASE STUDY USING AMBIENT TEMPERATURE PHOSPHATE CERAMICS PROCESS APPLIED TO HANFORD AND IDAHO WASTES
- 09:00 – 09:30 IV-2 V.A. Arkhangel'skiy, Russia
CHEMICALLY BOUNDED PHOSPHATE CERAMICS FOR NUCLEAR SHIELDING OF SPENT NUCLEAR FUEL
- 09:30 – 10:00 IV-3 O.M Slyuntchev, Russia
RESEARCH OF POSSIBILITY OF LIQUID RADIOACTIVE WASTES IMMOBILIZATION INTO LOW-TEMPERATURE PHOSPHATE MATRIX AND INFLUENCE OF IMMOBILIZED WASTES COMPOSITION ON ITS PHASE COMPOSITION
- 10:00 – 10:30 Coffee Break
- 10:30 – 11:00 IV-4 Emily Michie, UK
STRUCTURE AND DEFECT STABILITY OF CALCIUM PHOSPHATE MINERALS
- 11:00 – 11:30 IV-5 M. Orlova, Russia
PHOSPHATES WITH THE STRUCTURE OF MINERAL WHITLOCKITE ($\text{Ca}_3(\text{PO}_4)_2$)
- 11:30 – 12:00 IV-6 Neil Hyatt, UK
CHARACTERISATION OF A SIMULANT PLASMA VITRIFIED PLUTONIUM CONTAMINATED WASTE
- 12:30 – 14:00 Lunch
- 14:00 – 16:30 Free Time for leisure, recreation, *ad hoc* sessions
- 17:00 – 17:30 Afternoon Coffee
- 17:30 – 20:00 **Session V – Mineral Studies** Session Chair: Linn Hobbs
- 17:30 – 18:00 V-1 Menvie Bekale, CNRS, France
MODIFICATION OF THE MECHANICAL PROPERTIES INDUCED BY SWIFT HEAVY ION IRRADIATION IN CUBIC YTTRIA-STABILIZED ZIRCONIA
- 18:00 – 18:30 V-2 Catharina Nästrén, EU
A NEW DUST-FREE ROUTE FOR THE SYNTHESIS OF ZIRCONIA-BASED PYROCHLORE OXIDE WITH TRANSURANIUM ELEMENTS

Wednesday, March 28, 2007(continued)

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| 18:30 – 19:00 | V-3 Shirley Fong, USA
COMPARISON OF THE IMMOBILIZATION OF HF(IV) AND
CE(IV) SURROGATES IN FLUORAPATITES |
| 19:00 – 19:30 | V-4 Neil Hyatt, UK
SINGLE-PHASE TRANSITION METAL STABILIZED BARIUM
HOLLANDITE CERAMICS |
| 20:00 – 22:00 | Conference Banquet |

Thursday, March 29, 2007

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 12:30 **Session VI – Processes**
Session Chair: Veronique Fouchard
- 08:30 – 09:00 VI-1 I.I. Ivanov, Russia
BORON-PHOSPHATE GLASSES FOR IMMOBILIZATION OF
RADIOACTIVE WASTES
- 9:00 – 9:30 VI-2 Ewan Maddrell, UK
CERAMIC WASTEFORM DEVELOPMENT FOR THE
DISPOSITION OF UK PLUTONIUM STOCKS
- 9:30 – 10:00 VI-3 Martin Stennett, UK
COMPOSITIONAL DEVELOPMENT OF SINGLE PHASE
CERAMIC FORMULATIONS FOR PLUTONIUM DISPOSITION
- 10:00 – 10:30 Coffee Break
- 10:30 – 11:00 VI-4 Dennis Kelley, USA
EMERGING TECHNOLOGIES FOR THE TREATMENT OF
ORGANIC AND AQUEOUS WASTE STREAMS: U.S.
DEPARTMENT OF ENERGY AND INTERNATIONAL CASE
STUDIES
- 11:00 – 11:30 VI-5 Dirk Gombert, USA
INTEGRATED WASTE MANAGEMENT STRATEGY WASTE
DISPOSITION AND WASTE FORM OPTIONS FOR A CLOSED
FUEL CYCLE
- 11:30 – 11:45 Concluding Remarks
- 12:30 – 14:00 Lunch and Departure (bus to Pisa airport and train station for
those departing by train or staying overnight in Pisa)

POSTER PRESENTATIONS

- P1: Hitoshi Mimura, Tohoku University, Japan
Immobilization of Cesium and Strontium by Using Inorganic Materials
- P2: Lee A. Gerrard, AWE, UK
Comparison of the Immobilization of a Specific Waste Stream Using HF(IV) and CE(IV) as Surrogates for PU(IV)
- P3: Duane F. Warren, CeraLith Technology, Ltd, USA
Ceramic Cement Technology for Gen IV Construction Applications
- P4: S.M. Dorosev, SPE Spektr-Conversion LLC, Russia
Spent Nuclear Fuel from Nuclear Power Plants of Russia. Market Analysis of Potential Use of Ceramic Cements for Nuclear Shielding
- P5: M. Arbel-Haddad, Nuclear Research Center Negev, Israel
The Effect of High Salt Concentration on the Integrity of Silica-Fume Blended Cementitious Matrices for Waste Immobilization Applications
- P6: Dennis Kelley, Pacific Nuclear Solutions, USA
China's Scientific Investigation for Liquid Waste Treatment Solutions
- P7: M. Orlova, Novgorod State University, Russia
Investigating of Crystal Chemical Properties of Joint Entering of Lanthanides and Thorium in the Phosphates with Langbeinite Structure