Twentieth Symposium on Separation Science and Technology for Energy Applications

October 21-24, 2018
Gatlinburg, Tennessee 37738
Program Overview

SUNDAY, OCTOBER 21
6:00 – 8:00 pm  Early Check-in/Registration

MONDAY, OCTOBER 22
7:00 – 8:00 am  Check-in/Registration
8:00 am  Welcome
8:10 am  Session I – Solvent Extraction
1:30 pm  Session II – Membrane Separations
4:40 pm  Session III – Student Presentations
5:30 – 8:00 pm  Session IV – Reception/Poster Presentations

TUESDAY, OCTOBER 23
8:00 am  Session V – Adsorption and Ion Exchange
Afternoon  Free Time
6:30 pm  Session VI – Novel Separations

WEDNESDAY, OCTOBER 24
8:00 am  Session VII – Nuclear Fuel Cycle Separations
1:30 pm  Session VIII – Department of Energy Applications
6:00 pm  Banquet
Monday, October 22

**Welcome**

**20th SS&T**

8:00 am  Welcome  
Chair David DePaoli, Oak Ridge National Laboratory  
Co-Chair Ken Nash, Washington State University

**Session I**  
**Solvent Extraction**

Chair Delmau, Oak Ridge National Laboratory  
Co-Chair Mark Antonio, Argonne National Laboratory

8:10 am  Ion Recognition in Solvent Extraction: Design or Discovery?  
Bruce Moyer, Oak Ridge National Laboratory

8:50 am  Dipicolinic Acid-Based Ionic Liquids – Conventional Complexant Rendered Extractant  
Cory Hawkins, Tennessee Technological University

9:15 am  Soft-donor Dipicolinamide, Dithiopicolinamide and Pyrazole Ligands for Selective Am(III)/Ln(III) Separations and for Hg(II) Coordination and Extraction  
Konstantinos Kavallieratos, Florida International University

9:40 am  Break

10:05 am  Taylor-Couette Two Phase Flow  
Matthäus Siebenhofer, Graz, University of Technology

10:30 am  Development of Additive Manufacturing-Fabricated Annular Centrifugal Contactors  
Peter Kozak, Argonne National Laboratory

10:55 am  Investigation of Mixed Reagents on the Extraction of Lanthanides by Microemulsions  
Mikael Nilsson, University of California Irvine

11:20 am  Application of a Fine Bubble Former to Generating Emulsion Useful to Reactive Extraction of Heavy Metals from their Oxides  
Youichi Enokida, Nagoya University

11:45 am  Lunchtime (on your own)
Monday, October 22

**SESSION II**  **MEMBRANE SEPARATIONS**
Chair  Ranil Wickramasinghe, University of Arkansas
Co-Chair  Ramesh Bhave, Oak Ridge National Laboratory

1:30 pm  **Novel Magnetically Responsive Membranes by Surface Modification**
Ranil Wickramasinghe, University of Arkansas

2:10 pm  **Filtration of Hanford Tank AP-107 Supernatant**
Amy Rovira, Pacific Northwest National Laboratory

2:35 pm  **Break**

3:00 pm  **Evaluation and Characterization of Pd-Ag Composite Membrane Fabricated by Surfactant Induced Electroless Plating (SIEP) for Hydrogen Separation**
Ilias Shamsuddin, North Carolina A&T State University

3:25 pm  **Understanding and Reversing the Physical Aging Phenomenon in Carbon Molecular Sieve Hollow Fiber Membranes**
Samuel Hays, Georgia Institute of Technology

3:50 pm  **Enhancement of Gas Separation Performance of Membrane by Low Temperature Operation**
Jianzhong Lou, North Carolina A&T State University

**SESSION III**  **STUDENT PRESENTATIONS**
Chair  Kristian Myhre, Oak Ridge National Laboratory
Co-Chair  Shelley Van Cleve, Oak Ridge National Laboratory

5:00 pm  **Student Poster Presentations**
Brief, single-slide overviews of posters by student authors

**SESSION IV**  **POSTER PRESENTATIONS/RECEPTION** (in lieu of dinner)
Chair  Kristian Myhre, Oak Ridge National Laboratory
Co-Chair  Shelley Van Cleve, Oak Ridge National Laboratory

6:00-8:00 pm  **Poster Session**
### Tuesday, October 23

#### Session V Adsorption and Ion Exchange

**Chair**
Sotira Yiacoumi, Georgia Institute of Technology

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>8:00 am</td>
<td>Recovery of Radioactive Cesium from Clay Minerals in Soil Contaminated by Fukushima Daiichi Nuclear Power Plant Accident</td>
<td>Kenji Takeshita, Tokyo Institute of Technology</td>
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<tr>
<td>8:25 am</td>
<td>A Survey of Anion Exchangers and Aqueous Solutions for Perrhenate and Iodide Adsorption</td>
<td>Charles Nash, Savannah River National Laboratory</td>
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<tr>
<td>8:50 am</td>
<td>Anion Exchange for Mark-18A Plutonium Recovery</td>
<td>Edward Kyser, Savannah River National Laboratory</td>
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<td>9:15 am</td>
<td>Use of Ion Exchange Resin for Remediation of Uranium from Hanford Site Groundwater</td>
<td>Vanessa Holfeltz, Pacific Northwest National Laboratory</td>
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<td>9:40 am</td>
<td>Break</td>
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<tr>
<td>10:05 am</td>
<td>Recovery of Californium from SHE Irradiated Target Segments</td>
<td>Shelley Van Cleve, Oak Ridge National Laboratory</td>
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<tr>
<td>10:30 am</td>
<td>Novel Carbon Polyaniline Capacitive Deionization Electrodes with Long Cycle Life</td>
<td>M. Parans Paranthaman, Oak Ridge National Laboratory</td>
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<tr>
<td>10:55 am</td>
<td>Use of Neutron Imaging Techniques to Study Separation Processes and Materials</td>
<td>Kristian Myhre, Oak Ridge National Laboratory</td>
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<tr>
<td>11:20 am</td>
<td>Developing DG-OSPREY: A Gas-Phase Fixed-bed Adsorption Model Built on MOOSE</td>
<td>Austin Ladshaw, Georgia Institute of Technology</td>
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**Afternoon**  
Free Time
Tuesday, October 23

**SESSION VI**

**NOVEL SEPARATIONS**

Chair
Mark Dietz, University of Wisconsin-Milwaukee

6:30 pm  
**Adapting Microfluidics for Radioisotope Separations**  
Sandra Davern, Oak Ridge National Laboratory

6:50 pm  
**Functionalized Carbon Nanotubes for the Separation of Actinides**  
Arijit Sengupta, University of Arkansas

7:10 pm  
**Adsorption Study of U and Th by N,O-hybrid Donor Ligand-Immobilized Hydrogels**  
Masahiko Nakase, Tokyo Institute of Technology

7:30 pm  
**Break**

7:40 pm  
**Convergent Strategies for Accessing Soft-Lewis Basic Complexants for Minor Actinide Separations**  
Jesse Carrick, Tennessee Technological University

8:00 pm  
**Extraction Behavior of Lanthanides by a Novel Hydrophobic Ionic Liquid Including N,N,N',N'-tetrakis(2-pyridylmethyl)-1,3-diaminopropane-2-amido Structure: A Soft-hard Donor Combined Strategy**  
Hao Wu, Tokyo Institute of Technology

8:20 pm  
**Ionic Liquids Access to Unique Actinide Coordination Environments: From Seawater Extraction to Molten Salt Reactors**  
Robin Rogers, University of Alabama

8:40 pm  
**F-element Redox Chemistry Using Polyoxometalate Derivatized Metal Oxide Electrodes**  
Jeffrey McLachlan, Florida International University
Wednesday, October 24

SESSION VII  NUCLEAR FUEL CYCLE SEPARATIONS
Chair  Terry Todd, Idaho National Laboratory

8:00 am  Spent Nuclear Fuel Management - Identifying and Overcoming the Barriers to Commercial Reprocessing and Recycling in the United States of America
Emory Collins, Oak Ridge National Laboratory

8:40 am  Simulant Testing of a Co-Decontamination (CoDCon) Flowsheet for a Product with a Controlled Uranium-to-Plutonium Ratio
Gregg Lumetta, Pacific Northwest National Laboratory

9:05 am  A Water-soluble Dipicolinamide Holdback Reagent for Selective Am(III)/Ln(III) Separation
Ingrid Lehman-Andino, Florida International University

9:30 am  Break

9:55 am  Evaluation of Solvent Washing within the ALSEP Process
Dean Peterman, Idaho National Laboratory

10:15 am  Solvent Extraction Options for Pu-238 Production
David DePaoli, Oak Ridge National Laboratory

10:40 am  Mark-18A Chemical Flowsheet Development: Fundamental Chemistry to Full-scale Recovery of Pu-244
Kevin McCann, Savannah River National Laboratory

11:05 am  Aging of Silver-containing Adsorbents during Spent Nuclear Fuel Reprocessing Off-gas Treatment
Lawrence Tavlarides, Syracuse University

11:30 am  Lunchtime (on your own)
Wednesday, October 24

**SESSION VIII  DEPARTMENT OF ENERGY APPLICATIONS**
Chair  Sam Fink, Savannah River National Laboratory

1:30 pm  **Ion Exchange for Plutonium-238 Production**
Laetitia Delmau, Oak Ridge National Laboratory

1:55 pm  **Mark-18A Processing: Transuranic Recovery using N,N,N',N'-tetra-n-octyldiglycolamide (DGA) Resin**
Thomas Shehee, Savannah River National Laboratory

2:20 pm  **Uranium from Seawater Extraction to Commercial Chitin Extraction**
Gabriela Gurau, 525 Solutions, Inc.

2:50 pm  **Break**

3:15 pm  **Reductive Precipitation of Tc for Removal from the WIP Low Activity Waste Vitrification Off-Gas Recycle - Variable Composition and Scale-Up Studies**
Kathryn Taylor-Pashow, Savannah River National Laboratory

3:40 pm  **Cesium Removal from AP-105 Hanford Tank Waste Using Spherical Resorcinol Formaldehyde Resin**
Heather Colburn, Pacific Northwest National Laboratory

4:10 pm  **Zero Valent Iron for Tc-99 Removal from Hanford LAW Off-gas Condensate**
Tatiana Levitskaia, Pacific Northwest National Laboratory

4:35 pm  **Technetium Removal from Paducah Gaseous Diffusion Barrier Material**
William Wilmarth, Savannah River National Laboratory

**BANQUET**

6:00 pm  **SST BANQUET**
Title (TBA)
Ken Nash, Washington State University