

**Workshop on
Recoil Separator
for
Superheavy Element Chemistry
March 20 - 21, 2002
Gesellschaft für Schwerionenforschung,
Darmstadt, Germany**



Program

Organizers and chair-person: Matthias Schädel, GSI, Darmstadt, Germany
Andreas Türler, Inst. für Radiochemie, TU München, Germany

Wednesday, March 20, 2002 – MORNING

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| 1.1. Welcome | W. Henning |
| 1.2. Introduction, Idea and General Scope | A. Türler |
| 1.3. Structure of Workshop | M. Schädel |

2. Superheavy Elements

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| 2.1. Fusion Cross Sections | chair: K.E. Gregorich |
| 2.1.1. Cold and Hot Fusion Cross-Section Systematics | S. Hofmann |
| 2.1.2. Formation of Superheavy Elements in Heavy-Ion Reactions and Fusion Barriers | V.Yu. Denisov |
| 2.1.3. Neutron Transfer Effects in Nuclear Fusion | T. Schuck |
| 2.2. Nuclear Stability and Decay | chair: A. Popeko |
| 2.2.1. Nuclear Structure Investigations in the Region of Transfermium Elements | F.P. Hessberger |
| 2.2.2. An EC-Branch in the Decay of 27-s Db-263: Evidence for the new Isotope Rf-263 | J.V. Kratz |
| 2.3. Chemistry I | chair: J.V. Kratz |
| 2.3.1. Introduction into SHE Chemistry | H.W. Gäggeler |
| 2.3.2. Chemical Identification of Hassium (Hs, Z = 108) and Prospects for Future Studies | Ch.E. Düllmann |
| 2.3.3. First Chemistry Experiments with Element 112 | A. Yakushev |
| 2.3.4. Prospects for IVO Chemistry Experiment with Element 112 | S. Soverna |
| 2.3.5. Approaches to Element 114 Chemistry with and without Physical Preseparation | A. Yakushev |

Wednesday, March 20, 2002 - AFTERNOON

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| 2.3. Chemistry II | chair: H.W. Gäggeler |
| 2.3.6. Limitations of Online Gas Chemistry Technique to alpha-spectroscopy in Ca-48 induced SHE Applications | R. Dressler |
| 2.3.7. Development of Miniaturized Aqueous Chemistry Systems | U.W. Scherer |
| 2.3.8. Vacuum Thermochromatography - Revival of a Gas Phase Adsorption Separation Method to be Coupled to a Future "CHEMSEP" | R. Eichler |
| 2.3.9. Practical Results from Working with Preseparated ²⁵⁷ Rf | J.P. Omtvedt |
| 2.3.10. Recoil Separator - Curse or Promise for SHE One-Atom-at-a-Month Chemistry | C. Laue |
| 2.4. Ion Traps etc. | chair: N. Trautmann |
| 2.4.1. Ion Chemical Reactions with Heavy Elements in the Gas Phase | A. Dretzke |
| 2.4.2. Ion Mobility Measurements in the Region of Superheavy Elements with Z _{>=} 100 | M. Sewtz |
| 2.4.3. FT-ICR: A Non-Destructive Detection Method for Heavy Radionuclides at the SHIPTRAP Facility at GSI | C. Weber |
| 3.1. Ion Source, Targets, Windows, etc. | chair: R. Loughheed |
| 3.1.1. Conversion of some Neutron-Excess Isotope Chemical Forms available at the Market into Compounds suitable for Effective Feeding of a Cyclotron ECR Ion Source for Production of Highly Intense Ion Beam | V.Ya. Lebedev |
| 3.1.2. Preparation of Lanthanide and Actinide Targets for the new GSI Rotating Wheel Target Assembly | K. Eberhardt |
| 3.1.3. Status of the Target Development and Target Monitoring at SHIP | B. Kindler |
| 3.1.4. Window-less Operation of the JYFL Gas-filled Recoil Separator RITU | J. Uusitalo |

Thursday, March 21, 2002 - MORNING

4. Recoil Separators – Design and Achievements – Merits and Deficiencies

4.1. Velocity- and Energy Filters (separation in vacuum)

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| 4.1.1. The Velocity Filter SHIP | chair: C. Davids
D. Ackermann |
| 4.1.2. Design and Performance of Vassilissa Separator | A.V. Yeremin |
| 4.1.3. Experiments on Super-Heavy Elements with the Velocity Filter LISE III
= CANCELLED = | C. Stodel |
| 4.1.4. The Heavy-Ion Magnetic Spectrometer PRISMA | F. Scarlassara |

4.2. Gas-filled Separators

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| 4.2.1. Transmission of the JYFL Gas-filled Recoil Separator RITU | chair: S. Hofmann
M. Leino |
| 4.2.2. The Dubna Gas-filled Separator - Status Report | J. Wild |
| 4.2.3. The Recoil Transfer Chamber: A Gas-Jet Transport Device Coupled to
the Berkeley Gas-filled Separator | K. Gregorich |

5. New and Old Ideas, Concepts and Designs (related to a “CHEMSEP”) – chair: M. Leino

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| 5.1.1. Angle- and Energy Selection of the Heaviest Evaporation Residues Produced
in Complete Fusion Reactions | R.N. Sagaidak |
| 5.1.2. Design Study for a Recoil Separator for Superheavy Element Chemistry | C.N. Davids |
| 5.1.3. Electrostatic Preseparation for Chemistry of Superheavy Elements | O.N. Malychyev |
| 5.1.4. Gas-filled Magnet as Preseparator for Chemistry | A. Popeko |
| 5.1.5. About the Design of a Gas-filled Separator | T. Enquist |
| 5.1.6. A Superconductor Gas-filled Separator | K. Gregorich |
| 5.1.7. Experiments at ISOLDE with Homologs of the Elements 104 - 118 | U. Köster |

Thursday, March 21, 2002 - AFTERNOON

6. Concluding Discussion – Panel and Audience – chair: G. Münzenberg

6.1. Open Questions - moderated by Panel Chairperson

6.2. Most Promising Design(s) - moderated by Panel Chairperson

- 6.2.1. Gas-filled Separator vs Vacuum In-flight Separation
- 6.2.2. Design Parameters

6.3. What to do (test exp., calculations) ? – Who, when, where, ...?

6.4. Proposal to GSI, ... ? – Who, when, what, how, ..?

7. Concluding Remarks – M. Schädel, A. Türler