

# EURISOL DS

Kickoff Meeting

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CERN

## **Innovative Waste Management**

J. Neuhausen (PSI)

# General Outline

Goal

Prerequisites

Procedure

Expertise

Capabilities

Work Program Month 1-12

# Innovative Waste Management

Goal:

Reduction of radiotoxic components by chemical separation

Problem: Hg-isotopes cannot be chemically separated

Extraction of radionuclides for diagnostic/therapy purposes

# Prerequisites

Decision on which elements to extract

Short lived (medical): discontinuous procedure, selective

Long lived (safety): continuous procedure, no need to be selective

Thermochemical data, solubility data

Operating conditions of the loop:

spallation products concentration/production rate,

Total mass Hg, Impurities (oxide content), Temperature (gradients),

Flow rate, operation time

# Schematic program

Decision, which Isotopes to extract

Evaluation of thermochemical data  
Literature Data  
Theoretical Predictions

Precipitation/filtration

Oxidation/filtration

distillation

adsorption

Test experiments (laboratory scale)

Proposal on procedure, materials, operating conditions, additional chemical separation steps

# Expertise/Capabilities

Miedema Model:

Theoretical evaluation of metal-metal interactions

Calculation of thermochemical data: stability of amalgams and intermetallic phases, solubilities

Chemical analysis:

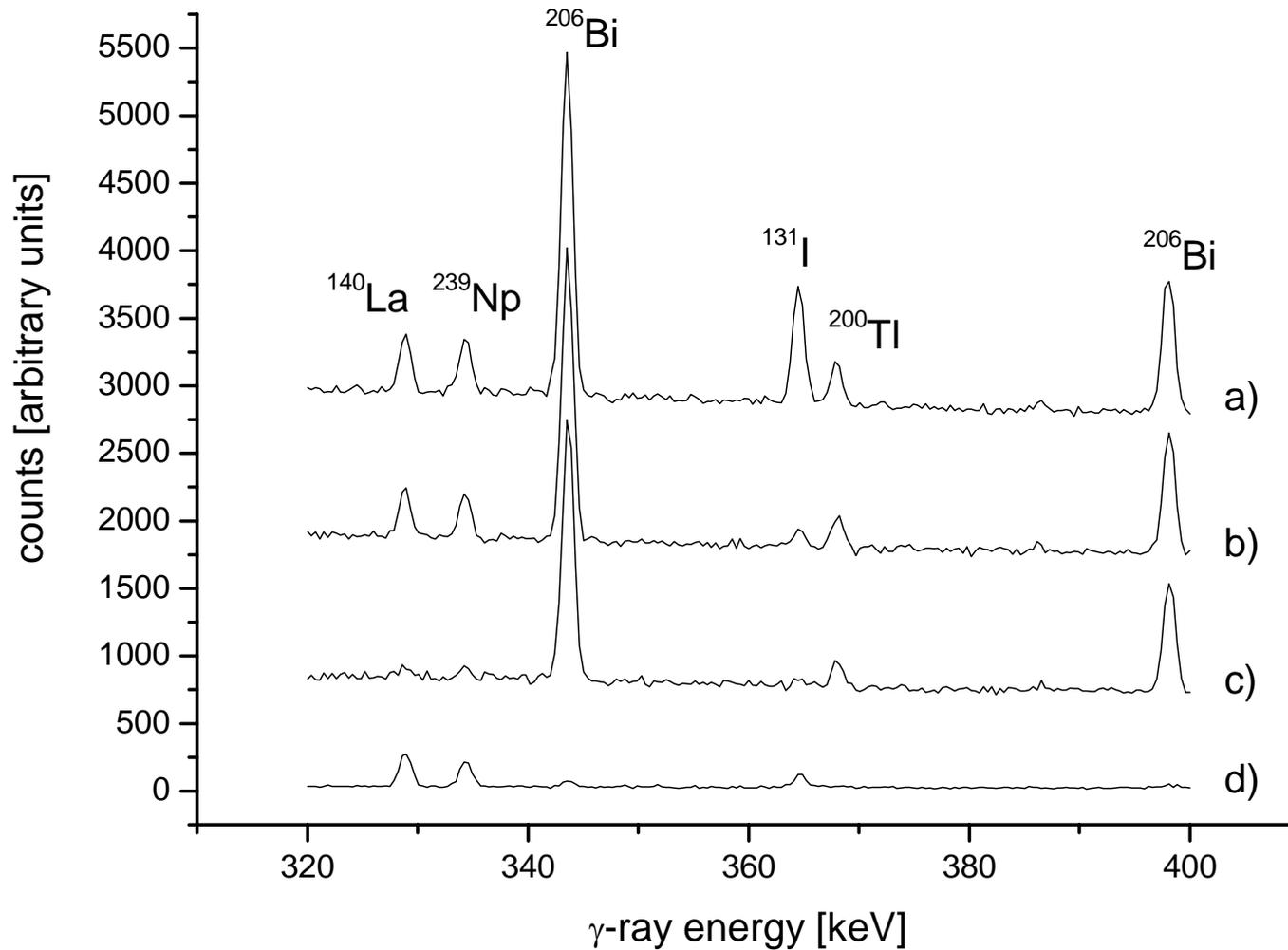
Radioanalytics and non-active chemical analyses

Laboratory scale experiments using radioactive tracers

Chemical separations

Determination of distribution of radiotracers in extraction/filtration/distillation/adsorption experiments

# Distribution of Iodine in Pb/Bi alloy, $\gamma$ -spectrometry



# Work plan for first year

Decision on isotopes to extract

Literature research on the chemical behaviour of these isotopes in Hg,

Solubility, amalgam formation

Theoretical evaluations using the MIEDEMA model

Selection of extraction methods to be studied experimentally