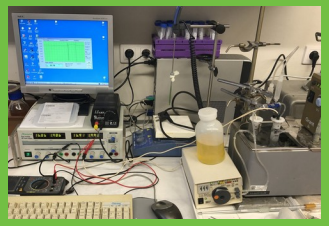
Target group

This dedicated training course has been designed for individuals, with at least Masters' level Chemistry background, who need to extend their skills and knowledge of nuclear and radiochemistry to the field of application of radionuclides and ionising radiation in analytical chemistry. Experience in handling open sources of ionising radiation in a radiochemistry laboratory is presumed.






Motivation

This training aims to introduce the participants to Radioanalytical Chemistry, a field belonging simultaneously to analytical chemistry and applied radiochemistry that is concerned primarily with the use of radionuclides and ionising radiation for analytical purposes. Participation in this course is a logical choice for (but not limited to) graduates of the CINCH Hands-on Training in Nuclear Chemistry who want to deepen their knowledge of applications of radiochemistry.


Czech Technical University in Prague

Faculty of Nuclear Sciences and Physical Engineering

Department of Nuclear Chemistry

Břehová 7, 11519 Prague 1

Czech Republic

MEET-CINCH Consortium

A Modular European Education and Training Concept In Nuclear and Radio Chemistry

meet cinch

http://www.cinch-project.eu

MEET-CINCH is a HORIZON 2020 EU Framework Programme project aiming to improve and evolve nuclear chemistry education and training in Europe.

The project closely collaborates with the European Network on Nuclear Chemistry Education and Training aiming to to shift the education and training in nuclear chemistry to a new level.

Contact:

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Funded by the Horizon 2020 Framework Programme of the European Union

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HANDS ON TRAINING IN RADIO-ANALYTICAL METHODS

Prague 2020
February 3-7

Objectives

While the course does not substitute full formal training, it provides fundamental theoretical knowledge of principles and concepts in all sub-fields of radioanalytical chemistry. The theoretical knowledge is complemented by practical hands-on training in the selected radioanalytical methods.

Arrangements

The course is organised by the MEET-CINCH Consortium and it consists of a theoretical component which will be delivered through combination of distance learning via CINCH Moodle and on-site face-to-face teaching. The practical hands-on component will take place in the laboratories at the Department of Nuclear Chemistry of CTU in Prague. All teaching will be in English.

Location

Department of Nuclear Chemistry - FNSPE
Czech Technical University in Prague
Břehová 7
11519 Prague
Czech Republic

Admission Requirements

To apply for attendance, visit the MEET-CINCH web at www.cinch-project.eu/events/courses/, download the application form, and send the filled-in form to our manager Ms. Štěpánka Maliňáková (malinakova@fjfi.cvut.cz). No course fee will be charged to the participants and a small budget exists to support a limited number of participants. Application deadline is December 31, 2019.

Travel Information

http://www.idos.cz

http://www.dpp.cz/en/

http://www.prg.aero/en/

Introductory lectures (CINCH Moodle)

Theoretical part of the course will be composed of self-study of e-learning materials and of topical on-site lectures. All the main sub-fields of radioanalytical chemistry will be covered, including the

- **Indicator methods** comprising
  - Indicator analysis including the analysis of naturally indicated systems
  - Isotope dilution analysis
  - Radio-reagent methods
- **Interaction methods** comprising
  - Activation analysis
  - Analysis based on the absorption and scattering of ionising radiation
  - Emission methods

Prerequisites

Obligatory prerequisites for enrolling into the hands-on part of the course are passing the:

- **Radioanalytical methods** – e-learning part.
- On-line **Radiation protection course**.

This must be demonstrated by success in all the respective quizzes and tests. All the materials will be available on CINCH Moodle learning management platform at

https://moodle.cinch-project.eu/

http://www.jaderna-chemie.cz/

Practical exercises (Feb 3-7, 2020)

Neutron Activation Analysis

Delayed neutrons activation analysis for the determination of heavy elements and uranium isotopic composition will be performed at the school nuclear reactor Vrabec (The Sparrow) VR-1 at CTU in Prague.

X-Ray Fluorescence

Determination of bulk composition of selected materials by X-ray Fluorescence Spectrometry will be demonstrated as an example of the interaction emission methods.

Solubility product determination

Determination of the solubility product constant K_s of insoluble salt by means of the activity concentration determination of the saturated solution above the labelled precipitate will be performed as an example of the indicator analysis.

Volume determination

Isotope dilution analysis will be applied for the determination of the volume of inaccessible object. ^{137m}Ba milked on-site from a ^{137}Cs–^{137m}Ba radionuclide generator will be used.

Radioimmunoassay

Application of radioimmunoassay (RIA) for the determination of antigen concentration will be demonstrated as an example of a radio-reagent method / concentration-dependent distribution method.

Radon measurement

Two methods will be used for the ^{222}Rn measurement. Radon concentration in drinking water radonated in a Revigator will be determined by LSC technique, while emanometry with Lucas chamber detectors will be used to determine the emanation coefficient of ^{226}Ra-containing solid sample.