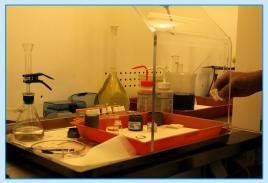
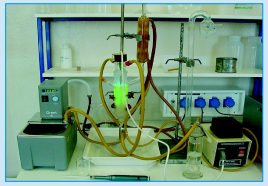
Target group

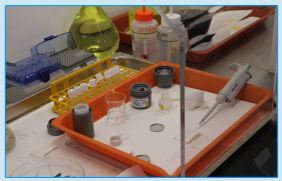
This dedicated training course aims at delivering the basics of nuclear and radiochemistry (NRC) to trainees with chemical background at Master level (chemistry masters or engineers, and/or fresh PhD students), who need to extend their skills and knowledge to the field of nuclear and radiochemistry.



Motivation

The lack of trained nuclear chemical specialists has been identified in all branches of nuclear industry and also in other areas where skills in NRC are required, such as radiopharmacy, nuclear medicine, radiation protection and radioecology, and many others. Retraining general chemistry graduates is one of the options for mitigating this problem.


Czech Technical University in Prague

Faculty of Nuclear Sciences and Physical Engineering

Department of Nuclear Chemistry

Břehová 7, 11519 Prague 1
Czech Republic

CINCH Consortium

Cooperation In education and training in Nuclear CHemistry

http://www.cinch-project.eu

CINCH-II is an EU 7TH Framework Programme project within EURATOM aiming to coordinate nuclear chemistry education and training in Europe.

The project initialized formation of the European Network on Nuclear Chemistry Education and Training and aiming to shift the education and training in nuclear chemistry to a quantitatively new level.

Contact:
malinakova@fjfi.cvut.cz

EUROPEAN COMMISSION
Community Research

CINCH

HANDS ON TRAINING IN NUCLEAR CHEMISTRY

Prague 2016
January 6-14

CINCH Consortium

SEVENTH FRAMEWORK PROGRAMME

Objectives

While the course does not substitute full formal training, it provides fundamental theoretical knowledge of principles and concepts in nuclear chemistry necessary for understanding the processes and methods in radiochemistry, and practical hands-on training required for the work with open ionising radiation sources (handling of radioactive materials, application of radionuclides and ionizing radiation, etc.).

Arrangements

The course is organised by CINCH Consortium and will take place at laboratories and lecture rooms of the Department of Nuclear Chemistry of CTU in Prague (Břehová 7, 11519 Prague, Czech Republic). In addition to attending lectures, the participants will pass thematic practical laboratory exercises.
All teaching will be in English.

Admission Requirements

For application for attendance of the course, please visit the CINCH web pages at www.cinch-project.eu/?art=courses, download the application form and send the filled-in form to Štěpánka Maliňáková (malinakova@fjfi.cvut.cz). No course fee will be charged to the participants and a small budget exists to support limited number of participants. Application deadline is November 30, 2015.

Accommodation

Accommodation in simple double rooms at CTU campus will be available for free.

Travel Information

http://www.idos.cz
http://www.dpp.cz/en/
http://www.prg.aero/en/

Introductory lectures (Jan 6-8, 2016)

Fundamentals of nuclear chemistry 1
Structure and properties of atomic nuclei.
Classification of radionuclides.
Kinetics of radioactive decay. Radioactive equilibria.
Binuclear reactions. Yield of nuclear reactions.

Fundamentals of nuclear chemistry 2
Natural radioactivity. Radioactive decay chains.
Nuclear fission, fission products. Hot atoms chemistry.
Szilard-Chalmers system. Radiation chemistry.
Actinides and transactinides.

Radiation detection and dosimetry
Interaction of IR with matter (α, β, γ, neutrons).
Detection of ionizing radiation (detector types, principles). Dosimetry of ionizing radiation.

Prerequisites

Radiation protection
Distance learning course on CINCH Moodle. Participants have to successfully finish this course before entering the on-site course.
http://cinch.moodlepartner.cz/

Practical exercises (Jan 11-14, 2016)

Handling of radioactive materials - pipetting, work behind shielding and in glove box.

Preparation of working solutions with required activity from the stock radionuclide.

Contamination survey, decontamination, preparation of wipe smear samples.

Radionuclide generator preparation and milking. Radioactive equilibria.

Sample activation via neutron irradiation.

Decay curve measurement and deconvolution, half-life determination.

Gamma-spectrometry – calibration, efficiency, measurement.

Liquid-liquid extraction of uranium. Uranium specific activity, estimation of its isotopic abundance.

Liquid scintillation counting.

www.cinch-project.eu
www.jaderna-chemie.cz
www.cvut.cz