name of the unit:

LABORATORY OF ISOTOPIC METHODS

Institute of Applied Radiation Chemistry, Lodz University of Technology

symbol:

I-34

http://www.mitr.p.lodz.pl

head of the unit:	potential promoters:	contact person:
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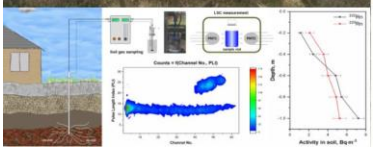
scope of activities:

- Monitoring of natural and artificial radionuclides in air, water, soil, etc. (cooperation with Central Laboratory for Radiological Protection and National Atomic Energy Agency)
- Activation of the cyclotron's structural elements with a beam of high-energy protons (cooperation with the M. Copernicus Hospital)
- Transport and migration of natural and artificial radionuclides in environment, utilization of natural ans artificial radioactive tracers
- New materials for solidification and stabilization of radioactive waste and protection of radioactive waste disposal facilities
- NORM and TENORM materials, characterization, utilization, reduction of radioactive elements concentration
- Shielding materials against ionizing radiation and evaluation of radiological hazard
- Problem of radon isotopes in air and water, determination of Rn-222 and Rn-220, evaluation of radiological hazard from radon and reduction of radon concentration



present activities:

The Laboratory of Isotopic Methods is part of the Institute of Applied Radiation Chemistry of Lodz University of Technology and carries out research related to determination of natural and artificial radioactive isotopes in any materials. Our laboratory possess wide measurement capabilities within the range of: a) natural and artificial radioactivity of environmental samples (soil, plants, water, air, food, etc.), b) industrial waste (NORM, TENORM, waste from extraction, chemical and metallurgical industries, energy and power generation sectors, radioactive waste, etc.), c) food, biological samples, mineral resources, building materials and total, fractionated and other aerosols.

Our laboratory is involved in the national and international systems of early detection of radioactive contaminants. The measuring equipment used in our laboratory are modern, low-background spectrometers of alpha and gamma radiation and liquid scintillation spectrometers as well as beta radiation counters. Based on the measurement techniques available in our laboratory, we carry out research and i implementation projects within the frames of presented scope of activities as well as various interdisciplinary projects.

future activities:

Utilization of radioactive isotopes as tracers for processes occurring in environment; development of new measurement methods for selected radioactive isotopes; research on new materials for radiological protection; new materials limiting release and migration of radioactive isotopes.

The portfolio of research groups was created as part of the Programme "STER" – Internationalisation of doctoral schools" as part of the realization of the project "Curriculum for advanced doctoral education & taining – CADET Academy of Lodz University of Technology".

publications/patents, awards, projects:

- H. Bem, M. Długosz-Lisiecka, D. Mazurek-Rudnicka, P. Szajerski, Occurrence of ^{222}Rn and ^{226,228}Ra in underground water and ^{222}Rn in soil and their mutual correlations for underground water supplies in southern Greater Poland. Environ. Geochem. Health, 2021, DOI: 10.1007/s10653-020-00792-z
- M. Długosz-Lisiecka, D. Tyborowski, M. Krystek, Radioactive fossils: The uranium anomaly and its paleobiological implications, Chemosphere 285 (2021) 131444, DOI: 10.1016/j.chemosphere.2021.131444
- M. Długosz-Lisiecka, T. Jakubowska, A. Zawada, High-Level Radioactive Wastes from ^{18}F and ^{11}C Isotopes Production J. Hazardous, Toxic and Radioactive Waste, 25 (2021) 04020072, DOI: 10.1061/(asce)hz.2153-5515.0000580
- P. Szajerski, Solidification of radioactive waste in lignite slag and bismuth oxide filled elastomer matrices: Release mechanism, immobilization efficiency, long term radiation stability and aging, Chemical Engineering Journal, 2021, 404, art. no. 126495, DOI: 10.1016/j.cej.2020.126495
- H. Bem, A. Gasiorowski, P. Szajerski, A fast method for the simultaneous determination of soil radon (^{222}Rn) and thoron (^{220}Rn) concentrations by liquid scintillation counting, Science of the Total Environment, 2020, 709, art. no. 136127, DOI: 10.1016/j.scitotenv.2019.136127

keywords:

radiation monitoring, radiological protection, isotopes, radioactive waste, radon, dosimetrym (TE)NORM

list of internship proposal in this research team:

Determination of radioactive isotopes in various materials, research on transport of radioactive isotopes