

APPLICATION OF ELECTRON BEAM IN FOOD PROCESSING

GLOBALIZATION OF ACCESS TO RADIATION TECHNOLOGIES



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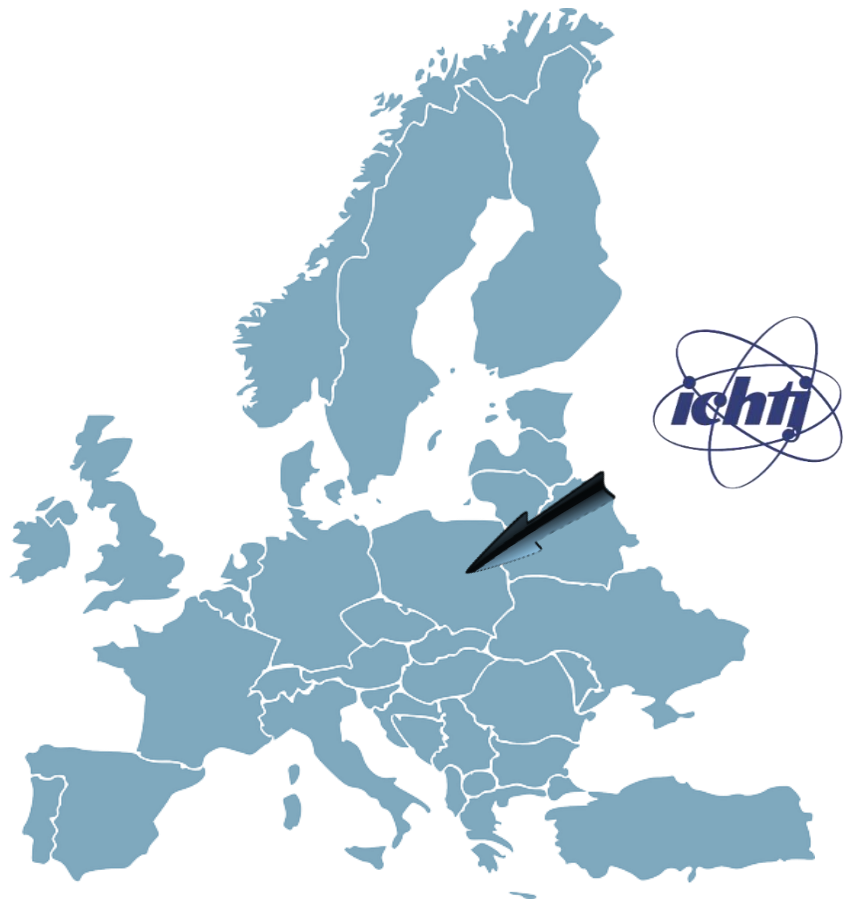
Institute of Nuclear Chemistry and Technology

Warsaw, Poland



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INSTITUTE OF NUCLEAR CHEMISTRY AND TECHNOLOGY (INCT)



Main research activity

- Radiation chemistry and technology
- Radiochemistry
- Radiopharmaceuticals
- Radiobiology
- Nuclear methods in materials and process engineering
- Trace analysis and radioanalytical techniques
- Nuclear instrumentation

Main products and services

- Tightness control and leak detection
- Sterilization and microbiological decontamination
- Polymer crosslinking
- Semiconductors irradiation
- Nuclear analytical methods

Education and promotion

- ERASMUS + „Joint innovative training and teaching/learning program in enhancing development and transfer knowledge of application of ionizing radiation in materials processing“
- International Ph. D. studies
- NUKLEONIKA Journal



HISTORY OF ELECTRON ACCELERATORS USE AT INCT

Food irradiation at INCT:

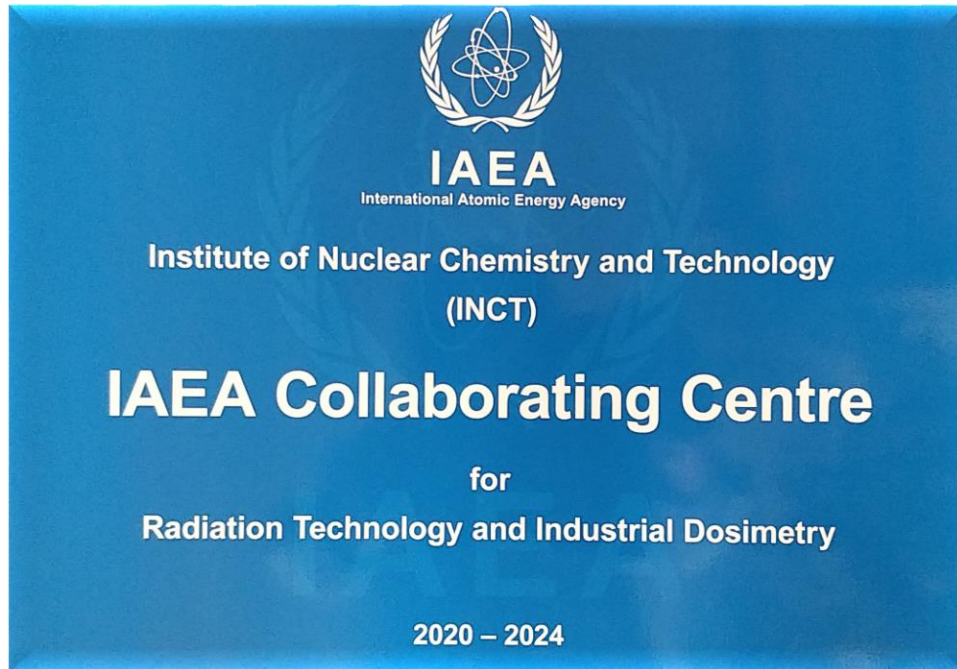
- Established in 1990
- PILOT accelerator (10 MeV, 1 kW)
- ELEKTRONIKA accelerator (10MeV, 10 kW)
- Approved for food irradiation in EU:
Reference number:
GIS-HZ-4434-W.- 3/MR/03

Research new applications of food irradiation

- E-beam effectiveness for: honey, therapeutic herbs
- Low energy electron beam irradiation of food

Accelerator	Place and year of installation	Beam parameters	Remarks
LAE 13/9 linac	INCT Warsaw, 1971	5 - 13 MeV 9 kW	R&D
As 2000 electrostatic	INCT Warsaw, 1987	0.1-2 MeV 0.2 kW	R&D
ILU 6 UHF	INCT Warsaw, 1988	0.2 -2 MeV 20 kW	Pilot plant for polymers modification, R&D
PILOT linac	INCT Warsaw, 1990	10 MeV 1kW	Pilot plant for food processing, R&D
ELW 3A transformer	EC Kawęczyn, Warsaw, 1991	0.5 – 0.7 MeV 50 kW	Pilot plant for flue gas treatment, R&D
Elektronika linac	INCT Warsaw, 1993	10 MeV 15 kW	Radiation sterilization
Elektronika linac	INCT Warsaw, 1993	10 MeV 10 kW	Food processing
LAE 10	INCT Warsaw, 2000	10 MeV	Pulse radiolysis
NHV transformer	EC Pomorzany, Szczecin 2002	0.7 MeV 4 x 262.5 kW	Flue gas treatment
LAE 10 linac	INCT Warsaw, Under construction	10 MeV 15 kW	Radiation sterilization

DEVELOPMENT OF RADIATION TECHNOLOGIES FOR FOOD TREATMENT



Research projects



Trainings



Access to infrastructure



Education and promotion

TRAININGS - KNOWLEDGE AND SKILLS

Radiation technologies:

- **Dosimetry** – basic knowledge on the use of different dosimetry systems, hands-on experience
- **Validation** of electron beam irradiation process – practical exercise using electron beam
- **Detection of irradiated food**
- Applications of ionizing radiation
- Effects induced by irradiation



ACCESS TO INFRASTRUCTURE

Access to research infrastructure

- Support from the IAEA (CRPs, RER)
- EU programmes
- Ionizing radiation sources:
 - electron beam accelerators (from 0.2 up to 10 MeV)
 - Gamma chamber (GC 5000)
- EPR spectrometry
- Analytical infrastructure
- Expertise – experienced staff



The screenshot shows the website for the ICHT (Instytut Chemii i Techniki Jądrowej) and the EURO-LABS project. The header includes the ICHT logo and the text 'INSTYTUT CHEMII I TECHNIKI JĄDROWEJ'. Below this, there is a navigation menu with options like 'GŁÓWNA', 'O NAS', 'DZIAŁALNOŚĆ', etc. The main content area features the EURO-LABS logo and the text 'EURO-LABS „European Laboratories for Accelerators Based Sciences”'. Underneath, there is a 'GENERAL INFORMATION' section with a paragraph describing the project's goals and a list of participating research infrastructures. A 'HOW TO APPLY' section is also visible at the bottom.



2023/12/15 15:07

Thank you for your attention!



***Maria
Skłodowska-Curie
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