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Nuclides.net : A Web-based Environment for Nuclear Education and Training in the Internet Age

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INTRODUCTION

Radionuclides have many applications in agriculture, industry, medicine and research. For basic information on such radioactive materials, the *Chart of the Nuclides* has proved to be an indispensable tool for obtaining data on radionuclides and working out qualitatively decay schemes and reaction paths. These charts are, however, of limited use when one requires quantitative information on the decaying nuclide and its daughter. This was the first motivation [1] of the Nuclides.net package, developed at the Institute for Transuranium Elements (see fig. 1).

This interactive multimedia tool based on the latest internet technology comes as an integrated environment for computations on radionuclides and their radiations. It has been developed by scientists working on a daily basis with radionuclides and is aimed at both students and professionals for reference data on radionuclides and calculations based on this data. The main emphasis of Nuclides.net is on nuclear science applications using international evaluated data. It is particularly suitable for educational purposes in the nuclear industry, health physics and radiation protection, nuclear and radiochemistry, nuclear physics, astrophysics, etc.

Fig. 1. Nuclides.net website www.nuclides.net.

FEATURES

From a powerful, user-friendly interface, the Nuclide Explorer, the user can navigate through the nuclide chart (fig. 2). In addition, the following web-based features are available:

Information and Articles: consisting of element information, articles, web-links, news and forum.
Data: consisting of data from internationally recognized sources on 3650 ground states and isomers, fact-sheets, cross-sections, fission products and yields
Applications: consisting of decay calculations, dosimetry and shielding calculations, "virtual" nuclides (for mixtures) and the Universal Nuclide Chart

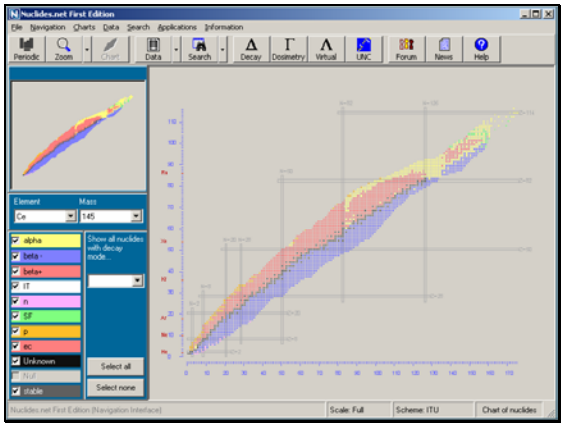

Fig. 2. Nuclide Explorer: for user-friendly navigation through the nuclide chart

TRAINING COURSES

Nuclides.net is published by Springer Verlag [2]. Training courses based on the product are held regularly at the Institute for Transuranium Elements in Karlsruhe (information can be obtained from the website). A key feature of these courses is the interactive web-based training through a series of Case Studies. These introduce the user to the diversity of tasks that can be tackled with Nuclides.net. Current case studies cover:

(Dating): "Age" of Pu particles

(Nuclear Medicine) ^{213}Bi milking from ^{225}Ac

(Fuel Cycle): Radiotoxicity of spent nuclear fuel

(Transmutation): Laser induced fission of thorium

(Radiological Dispersion Devices): Source term characterization

REFERENCES

1. J. MAGILL, R. SCHENKEL, New Challenges in Nuclear Science: Recent Activities at ITU, atw 46, vol 12, 2001.
2. J. MAGILL, *Nuclides.net · An Integrated Environment for Computations on Radionuclides and their Radiation*, Springer Verlag, Heidelberg (2002). For further information, see the Nuclides.net website at http://www.nuclides.net.