Nuclides.net: A Web-based Environment for Nuclear Data and Applications

Jean Galy, Joseph Magill

EU-JRC- Institute for Transuranium Elements

Nuclides.net is an interactive multimedia tool based on the latest internet technology. The software provides 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.

From a powerful, user-friendly interface, the Nuclide Explorer, the user can navigate through the nuclide chart. Among the multiple features, such as dosimetry and shielding calculations, a large amount of data is available to the user. This data comes from internationally recognized sources and provides nuclear information on 3650 ground states and isomers, including fact-sheets, cross-sections, fission products and yields, from a simple mouse click.

The basic radioactive decay data used in the nuclides.net database is from the NUBASE evaluation. The evaluation contains experimentally known nuclear properties, and some that have been estimated from extrapolation, for approximately 3650 nuclides: mass, isomeric excitation energy, half-life, spin, parity, decay modes and intensities.

The effective dose coefficients have been taken from the International Commission for Radiological Protection ICRP reports.

Spectral data is from the Joint Evaluated File (JEF) version 2.2, with a few corrections for known inaccuracies in the file.

Averaged cross section data are based on JEF-2-2, ENDF/B-VI, JENDL-3.2, BROND-2, and CENDL-2. Additional graphs of point-wise cross-sections based on JENDL3.2 have recently been added.

Fissions yield data are from: JENDL-3.2, JEF-2/FPY and ENDF/B6 data files.

Nuclides.net is web server based tool, which, therefore, allows it to be updated with the latest data files when available.

Email: jean.galy@itu.fzk.de