

another possible a source

88-Ra-226

This nuclide with Be-9 is useful for moisture gauge. = n'

- Atomic Mass: 226.0254026 $\pm$ 0.0000027 amu
- Excess Mass: 23662.324 $\pm$ 2.500 keV
- Binding Energy: 1731609.532 $\pm$ 2.520 keV
- Beta Decay Energy: B- -640.210 $\pm$ 3.273 keV

"The 1995 update to the atomic mass evaluation" by G.Audi and A.H.Wapsta, Nuclear Physics A595 vol. 4 p.409-480, December 25, 1995.

- Spin: 0+
- Half life: 1600 Y *1,600 years*
- Mode of decay: Alpha Rn-222 *gives off Radon*
 - Decay energy: 4.871 MeV
- Mode of decay: 14C *less than the 5.6 MeV of Am²⁴¹*
 - Branch ratio: 3.2E-9 %
 - Decay energy: 28.199 MeV
- Possible parent nuclides:
 - Beta from Fr-226
 - Electron capture from Ac-226
 - Alpha from Th-230

R.R.Kinsey, et al., *The NUDAT/PCNUDAT Program for Nuclear Data*, paper submitted to the 9th International Symposium of Capture-Gamma-ray Spectroscopy and Related Topics, Budapest, Hungary, October 1996. Data extracted from NUDAT database (Dec. 18, 1997).

Cross section graphs:

Ra226(N,G) * JENDL-3.1

Most of cross section data are adopted from NGATLAS - Atlas of Neutron Capture Cross Sections (Courtesy of IAEA NDS)

Total Cross Section

- at 0.0253 eV = 22.58 b
- Maxwell avg. at 0.0253 eV = 21.86 b
- at 14 MeV = 6.157 b
- Fission spectrum avg. = 7.554 b
- g-factor = 1.0922

Elastic Scattering Cross Section

- at 0.0253 eV = 9.796 b
- Maxwell avg. at 0.0253 eV = 9.778 b
- at 14 MeV = 3.132 b
- Fission spectrum avg. = 5.481 b
- g-factor = 1.1263

Total Inelastic Cross Section

- at 14 MeV = 588.4 mb
- Fission spectrum avg. = 1.936 b

(n,2n) Cross Section

- at 14 MeV = 755.7 mb
- Fission spectrum avg. = 26.69 mb

(n,3n) Cross Section

- at 14 MeV = 1.670 b
- Fission spectrum avg. = 253.8 micro barn

Total Fission Cross Section

- at 0.0253 eV = 7.000 micro barn
- Maxwell avg. at 0.0253 eV = 6.201 micro barn
- Resonance integral = 11.86 mb
- at 14 MeV = 11.50 mb
- Fission spectrum avg. = 337.8 micro barn
- g-factor = 0.9996

(n,4n) Cross Section

- Fission spectrum avg. = 0.1428 micro barn

Radium - ele. 88

all Radium appears only in decay chains.

²²⁶88 Ra is what we find in nature from the decay of Uranium, and on antique alarm clocks. It is what Marie Curie isolated from pitchblende.

Isotopes run from Ra²⁰⁶ through Ra²³⁰ mostly man-made in reactors.

Radiative Capture Cross Section

- at 0.0253 eV = 12.78 b
- Maxwell avg. at 0.0253 eV = 12.07 b
- Resonance integral = 285.5 b
- at 14 MeV = 31.97 micro barn
- Fission spectrum avg. = 108.5 mb
- g-factor = 1.0656

XS averaged from JENDL3.2, Courtesy of T. Nakagawa at JAERI



Element Ra



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- Spin: 0+
- Decay energy: 4.871 MeV
- Mode of decay: 14C
- Branch ratio: 3.2E-9 %
- Decay energy: 28.199 MeV

• Possible parent nuclides:

Beta from Fr-225

Electron capture from Ac-225

Alpha from Th-230

R.R. Kniey, et al., The NUDAT/PCNUDAT Program for Nuclear Data, paper submitted to the 9th International Symposium of Capture-Gamma-ray Spectroscopy and Related Topics, Budapest, Hungary, October 1996. Data extracted from NUDAT database (Dec. 15, 1997).

Cross section graphs:

Ra-226(N,G) * JENDL-3.1

Most of cross section data are adopted from NGATLAS - Atlas of Neutron Capture Cross Sections (Courtesy of IAEA NDS)

Total Cross Section

- at 0.0253 eV = 22.59 b
- Maxwell avg. at 0.0253 eV = 21.86 b
- at 14 MeV = 6.157 b
- Fission spectrum avg. = 1.554 b
- g-factor = 1.0922

Elastic Scattering Cross Section

- at 0.0253 eV = 9.796 b
- Maxwell avg. at 0.0253 eV = 9.775 b
- at 14 MeV = 3.132 b
- Fission spectrum avg. = 5.481 b
- g-factor = 1.1283

Total Inelastic Cross Section

- at 14 MeV = 586.4 mb
- Fission spectrum avg. = 1.836 b

(n,2n) Cross Section

- at 14 MeV = 755.7 mb
- Fission spectrum avg. = 26.69 mb

(n,3n) Cross Section

- at 14 MeV = 1.670 b
- Fission spectrum avg. = 258.8 micro barn

Total Fission Cross Section

- at 0.0253 eV = 7.005 micro barn
- Maxwell avg. at 0.0253 eV = 6.201 micro barn
- Resonance integral = 11.85 mb
- at 14 MeV = 11.50 mb
- Fission spectrum avg. = 337.8 micro barn
- g-factor = 0.9995

(n,4n) Cross Section

- Fission spectrum avg. = 0.1428 micro barn

Radium - ele. 88

all Radium appears only in decay chains.

²²⁶Ra is what we find in nature from the decay of Uranium, and on antique alarm clocks. It is what Marie Curie isolated from pitchblende.

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