VI ONLINE NUCLIDE CHART

WWW Chart of the Nuclides

Huang Xiaolong Zhou Chunmei Zhuang Youxiang Zhao Zhixiang
(China Nuclear Data Center, P.O.Box 275 (41), Beijing 102413, P.R.China)
T.V. Golashvili
(Atominform, P.O.Box 971, 127434, Moscow, Russia)
V.P. Chechev
(V.G.Khlopin Radium Institute, St. Petersburg 28 Second Murinsky Avenue,194021, Russia)

Abstract

WWW chart of the nuclides was established on the basis of the latest evaluations of nuclear structure and decay data. By viewing WWW chart of the nuclides, one can retrieve the fundamental data of nuclide such as atomic mass, abundance, spin and parity; the decay mode, branching ratio, half-life and Q-value of radioactive nuclide, energy and intensity of strong γ-ray, etc. The URL of WWW chart of the nuclides is: http://myhome.py.gd.cn/chart/index.asp.

1 Introduction

The chart of the nuclides is very useful to the nuclear scientists. Through the chart, it's very easy and rapid to get the fundamental nuclear data such as atomic mass, abundance, spin and parity; the decay mode, branching ratio, half-life and Q-value of radioactive nuclide, energy and intensity of strong γ-ray, etc. Thus the main nuclear data centers in the world have setup their own chart of the nuclides.

The cooperation in the field of the chart of the nuclides between China and Russia has been starting since 1995. Up to now they have compiled and

recommended lots of nuclear data. On the basis of these researches, we prepared WWW chart of the nuclides.

2 Data and WWW server

All the data in the WWW chart of the nuclides are from our recommendations evaluated by China and Russia scientists and from the most recent evaluations in NNDC (by the end of march, 2000).

The contents of chart of the nuclides was tabulated, graphed and published on the Internet. The Windows NT system is adopted and ACCESS is served as the data file language. The New Century of PANG YU (http://myhome.py.gd.cn), China, provided the free space to store the chart of the nuclides.

The URL of WWW chart of the nuclides is: http:// myhome. py.gd.cn /chart /index.asp. In order to protect WWW chart of the nuclides, the homepage was encrypted. You can use the common account (user and password is xxx) to visit this homepage if you don't want to apply another new user.

The arrangement of this WWW chart is firstly presenting map of all known nuclides. Each horizontal row represents one element. A vertical column represents the nuclides with the same neutron numbers.

This WWW chart of the nuclides is made up about 18 parts. Each part has a size of about 50 kbytes. When you click a region of dot, you may see more detailed chart section. By clicking a cell, you may get property of a nuclide or atom.

The following figure (see Fig.1) is an example of the partial map.

3 Application

To find a nuclide, you can click the numbers in the sensitive fig, or enter an atomic number and a mass number of a nuclide and then press the submit box.

Here is an example. When we enter 75 and 184 and press submit, we can get the following nuclear data.

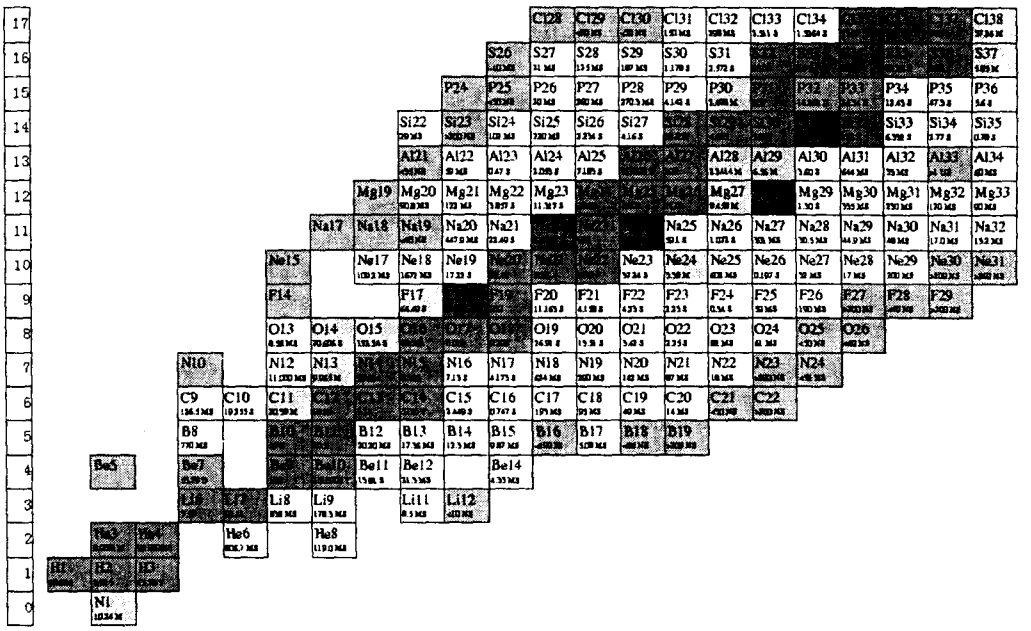

Fig.1 Partial map of color WWW chart of the nuclides

75-RE-184

Atomic Mass	Mass Excess
183.952524646889 amu	-44.223 MeV

Level energy (MeV)	Spin & parity	Half-life	Mode of decay	Branch ratio(%)	Decay energy (MeV)
Ground state	3(-)	38.0 D 0.5	EC	100	1.483
.188	8(+)	169 D 8	IT	75.4	.188
.188	8(+)	169 D 8	EC	24.6	1.671

Strong Gamma-rays from Decay of RE-184

Decay mode	Half-life	Gamma-ray energy (keV)	Intensity (%)
EC	169 D 8	55.278	2.3+- 0.3
IT	169 D 8	104.729	13.4+- 0.5
EC	169 D 8	111.207	5.8+- 0.4
EC	169 D 8	161.269	6.5+- 0.4
EC	169 D 8	215.326	2.78+- 0.15
EC	169 D 8	216.547	9.4+- 0.5
EC	169 D 8	226.748	1.47+- 0.08

EC	169 D 8	252.845	10.7+- 0.6
EC	169 D 8	318.008	5.7+- 0.3
EC	169 D 8	384.250	3.13+- 0.15
EC	169 D 8	536.674	3.30+- 0.16
EC	169 D 8	792.067	3.69+- 0.19
EC	169 D 8	894.760	2.75+- 0.16
EC	169 D 8	903.282	3.74+- 0.19
EC	169 D 8	920.933	8.1+- 0.4
EC	169 D 8	1110.08	0.58+- 0.04
EC	169 D 8	1173.77	1.21+- 0.09
EC	38.0 D 0.5	111.207	17.1+- 0.8
EC	38.0 D 0.5	252.845	3.0+- 0.3
EC	38.0 D 0.5	641.915	1.94+- 0.06
EC	38.0 D 0.5	769.778	0.67+- 0.03
EC	38.0 D 0.5	792.067	37.5+- 1.1
EC	38.0 D 0.5	894.760	15.6+- 0.5
EC	38.0 D 0.5	903.282	37.9+- 1.1
EC	38.0 D 0.5	1022.63	0.52+- 0.04

4 Conclusion

The WWW chart of the nuclides was published. By viewing WWW chart of the nuclides, one can retrieve the fundamental data of nuclide such as atomic mass, abundance, spin and parity; the decay mode, branching ratio, half-life and Q-value of radioactive nuclide, energy and intensity of strong γ-ray, etc. It's very convenient to use WWW chart of the nuclides.

The URL of WWW chart of the nuclides is http://myhome.py.gd.cn/chart/index.asp.

This WWW chart of the nuclides may not be corrected. Whenever you find some mistakes, please let us know (huangxl@iris.ciae.ac.cn). Any valuable comments are always appreciated.

Acknowledgement

The authors would like to attaind their sincere acknowledgment to the New Century of PANG YU(http://myhome.py.gd.cn), China, to provide the free space.

CINDA INDEX

Nuclide	Quantity	Energy/ eV		Lab	Type	Documentation					Author, Comments
		Min	Max			Ref	Vol	Page	Date		
^{177}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{178}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{179}Hf	Calculation	1.0+3	2.0+7	ZHN	Theo	Jour CNDP	24	72	Dec	2000	Liu Jianfeng+, SIG, DA, DA/DE
^{179}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{180}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{180}Hf	Calculation	1.0+3	2.0+7	ZHN	Theo	Jour CNDP	24	72	Dec	2000	Liu Jianfeng+, SIG, DA, DA/DE
^{Nat}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{206}Pb	Evaluation	1.0-5	2.0+7	SIU	Eval	Jour CNDP	24	93	Dec	2000	Ma Gonggui +, SIG, DA, DE
^{237}Np	Calculation	1.0+3	2.0+7	NKU	Theo	Jour CNDP	24	66	Dec	2000	Cai Chonghai +, SIG, DA, DA/DE
^{238}Pu	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	29	Dec	2000	Shen Qingbiao +, SIG, DA, DA/DE
^{240}Pu	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	80	Dec	2000	Yu Baosheng +, SIG, DA, DA/DE
^{241}Pu	Calculation	1.0+3	2.0+7	NKU	Theo	Jour CNDP	24	54	Dec	2000	Cai Chonghai +, SIG, DA, DA/DE
^{242}Pu	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	60	Dec	2000	Shen Qingbiao +, SIG, DA, DA/DE
^{241}Am	Calculation	1.0+3	2.0+7	NKU	Theo	Jour CNDP	24	33	Dec	2000	Cai Chonghai +, SIG, DA, DA/DE
^{242}Am	Calculation	1.0+3	2.0+7	NKU	Theo	Jour CNDP	24	33	Dec	2000	Cai Chonghai +, SIG, DA, DA/DE

CINDA INDEX

Nuclide	Quantity	Energy/ eV		Lab	Type	Documentation					Author, Comments
		Min	Max			Ref	Vol	Page	Date		
^{10}B	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	6	Dec	2000	Zhang Jingshang +, MDL,CALC,SIG,DA,DA/DE
^{11}B	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	13	Dec	2000	Zhang Jingshang +, MDL,CALC,SIG,DA,DA/DE
^{16}O	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	20	Dec	2000	Zhang Jingshang +, MDL,CALC,SIG,DA,DA/DE
^{75}As	(n,γ)	5.0+5	1.5+6	BJG	Expt	Jour CNDP	24	1	Dec	2000	Zhang Guohui , SIG
^{129}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{131}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{132}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{134}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{135}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{136}Xe	Evaluation	1.0-5	2.0+7	AEP	Eval	Jour CNDP	24	115	Dec	2000	Yu Baosheng +, SIG, DA, DE
^{144}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{147}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{148}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{149}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{150}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{151}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{152}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{154}Sm	Calculation	1.0+3	2.0+7	AEP	Theo	Jour CNDP	24	43	Dec	2000	Shen Qingbiao, SIG, DA, DE
^{174}Hf	Calculation	1.0+3	2.0+7	ZHN	Theo	Jour CNDP	24	72	Dec	2000	Liu Jianfeng+, SIG, DA, DA/DE
^{176}Hf	Evaluation	1.0-5	2.0+7	ZHN	Eval	Jour CNDP	24	103	Dec	2000	Wang Tingtai +, SIG, DA, DE
^{176}Hf	Calculation	1.0+3	2.0+7	ZHN	Theo	Jour CNDP	24	72	Dec	2000	Liu Jianfeng+, SIG, DA, DA/DE