CRIBE – Task 3 of JRA Eurisol (WP14)

Milestone MS52: Compiled data of of RIBs of some European ISOL facilities

Laboratories contributors to the present work:
GANIL (coordinator), CERN, JYVASKYLA, LNL, IFJ-PAN (partner)

The facilities who participated to this work:
SPIRAL1 (GANIL), S3 (GANIL), ISOLDE (CERN), SPES (LNL), Physics Department (JYVASKYLA)

Students who participated to the data of CRIBE:
M. Celary/AGH, Cracow (for the data compilation and the technical link between CRIBE database and ISOLDE Database),
P. Jourdan, P-M Briéda and Y. Jacquier (Normandy University) (for different aspects of nuclear data or other CRIBE technical issues)

External company: APLICaen (Junior company of ENSICAEN) for the development of the database of CRIBE and of the website of this application

A. General overview

The EURISOL JRA Task CRIBE is dedicated to the development of a tool (called in the following CRIBE) aiming in a presentation of the main characteristics of Radioactive Ion Beams (RIB) produced in major European ISOL facilities. These characteristics will be mainly the nature of the produced isotope, its acceleration and/or pre-acceleration energy, the RIB purity when it is available and its intensity.

The work on CRIBE is divided in two big chapters:

1. the first deals with the technical development of the chart of beams. In this part, the mode of the visualization of the data, of their presentation, of the way of the uploading and downloading the data will be defined. It is an important amount of programming work.
2. The second deals with the data itself. In this part, the choice of the parameters characterizing RIBs, the format of the presentation and a compilation of the data have to be specified.

The present MILESTONE deals with the compilation of RIBs data for post-accelerated phase (when it is available) and pre-accelerated phase (when it is available). The facilities whose the data were prepared for this milestone are SPIRAL1, S3, ISOLDE, JYVASKYLA and ISOLDE. It is possible that other facilities publish their own data when they are available in CRIBE chart when this last is definitely carried out.

B. RIB data format

Data from following facilities was supplied in form of the excel files:

Facility:	Public link to the data:
S3/GANIL, France	http://u.ganil-spiral2.eu/chartbeams/
SPIRAL1/GANIL, France	http://u.ganil-spiral2.eu/chartbeams/
SPES, Italy	https://web.infn.it/spes/index.php/characteristics/spes-beams-7037/spesbeamstable
IGISOL, Finland	--

In order to insert the data to the database, we unified the format of these data as below:

Z	A	Metastability	Half-life	Intensity [pps]	Intensity estimation method	Purity	Primary beam	Primary beam intensity [pps]	Target	Availability	Comments/ Link to details
(INT)	(INT)	(STRING)	(STRING)	(INT)	(STRING)	(INT)	(STRING)	(INT)	(STRING)	(STRING)	(STRING)
1	1	g	999.9s	9,99E+02	[A]	99.9	xyz	9,99E+02	xyz	2019	www.eg.com
2	2	x	< 3E+04h	9,99	[B]	99,9	xyz	9,99	xyz	2020	xyz
3	3	m	?	9.99	[C]	9	xyz	9.99	xyz	available	xyz
4	4	m1	xyz	9.99E-9	[D]		xyz	9.99E-9	xyz	2017	xyz

To achieve this, following manipulations were carried out on supplied excel files:

- Each data field containing comments or some other notation was investigated for its meaning. After that fields were stripped from comments and rewritten to match required data type
- Beam records were classified into one of those four categories based on the method how the intensity was estimated:

  [A]   measured in the experiment
  [B]   extrapolated from experiment data
  [C]   measurement scaled by transmission
  [D]   calculated

- Each beam was assigned with "availability" parameter based on the information from facilities representatives themselves
- Symbolic notation "4He" was changed to Z=2, A=2, metastability=g
- Primary beam intensities were calculated for each beam

The following table shows an example of the compiled data in the unified format:

Z	A	Metastability	Half-life	Intensity [pps]	Intensity estimation method	Purity	Primary beam	Primary beam intensity [pps]	Target	Availability	Comments/ Link to details
2	6	g	0.8 s	2E+08	[A]		13C	1,6E+13	Carbon	2017	https://u.ganil-spiral2.eu/chartbeams/
2	6	g	0.8 s	2,5 E+6	[A]		13C	1,6E+13	Carbon	2017	https://u.ganil-spiral2.eu/chartbeams/
2	6	g	0.8 s	15642541	[D]		13C	7,69E+12	Carbon	2019	https://u.ganil-spiral2.eu/chartbeams/
2	6	g	0.8 s	9385525	[D]		16O	4,93E+12	Carbon	2019	https://u.ganil-spiral2.eu/chartbeams/

C. Data files

The excel files attached to this document and containing the compiled RIBs data are:

ISOLDE.xls
JYVASKYLA.xls
SPIRAL1_POSTACC.xls
SPIRAL1_PREACC.xls
S3_PREACC.xls