Universal Materials Database

Jodi Cooley
Southern Methodist University

Need

- There exists an extensive amount of information on backgrounds of various materials in the low background community.
- There is a desire to share that information across collaborations in an efficient manner.

Proposed Solution

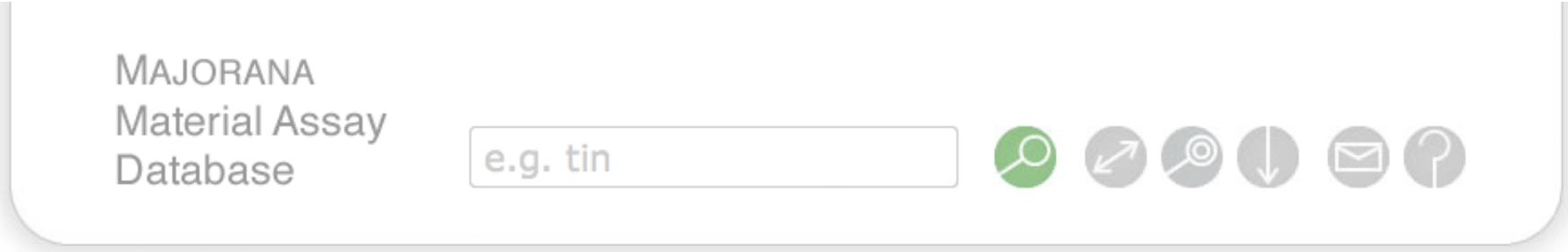
- A community database software package.

Options

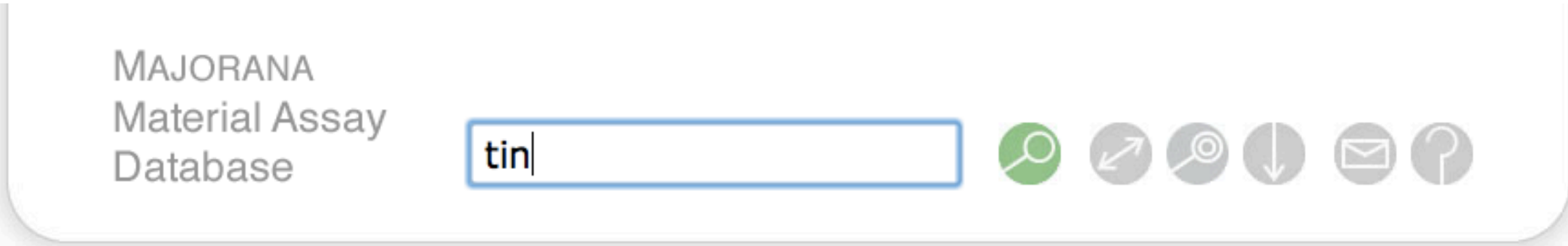
- At the last meeting we discussed some options:
  - ILIAS radiopurity database (Pia Loaiza, LSM France)
  - Low Background Facility Database (James Loach, LBNL)
    - open source software
    - tested by LBF and MAJORANA

LBF Database Details

- Engine - Apache CouchDB
- Search Facility - Apache Lucene
- Application Framework - CouchApp
- Front End - Persephone



James Loach
Feb.



- Tin, LANL
- Tin, LANL
- Tin, Canberra

MAJORANA
Material Assay
Database

tin

⊟ Tin, LANL

sample	description	Tin, 99.9998% purity			
measurement	technique	Gamma			
	results	U chain	< 1.7		mBq/kg
		Th chain	< 3.1		mBq/kg
		K-40	25	(14)	mBq/kg
		Co-60	< 1.5		mBq/kg

⊞ Tin, LANL
⊞ Tin, Canberra

MAJORANA
Material Assay
Database

tin

⊟ Tin, LANL

sample	description	Tin, 99.9998% purity
	source	Adam Montoya, LANL
	owner	LANL
	set	Majorana
	mass	710 g
	geometry	Block of metal
measurement	technique	Gamma
	institution	LANL / WIPP
	date	5 / 2010
	practitioner	Steve Elliot, LANL (elliotts@lanl.gov)
	description	The tin was placed inside two nested plastic bags and put inside the WIPP-n cavity. Background spectrum 66.78 days.
	count length	99.2 d
	detector	WIPP-n
	results	U chain < 1.7 mBq/kg
		Th chain < 3.1 mBq/kg
		K-40 25 (14) mBq/kg
		Co-60 < 1.5 mBq/kg
data	reference	Majorana report M-TECHDOCDET-2010-110
	entry by	James Loach (jcloach@lbl.gov)

⊞ Tin, LANL
⊞ Tin, Canberra

MAJORANA
Material Assay
Database

tin

Tin, LANL

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entry by James Loach (jcloach@lbl.gov)

Export

Copy and paste into Excel or similar.

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"Tin, LANL",,"U chain","<","1.7",,"mBq/kg","Th chain","
<","3.1",,"mBq/kg","K-40",,"25","14","mBq/kg","Co-60","
<","1.5",,"mBq/kg"
"Tin, LANL",,"Li","<","0.007",,"ug/g","Be","
<","0.004",,"ug/g","Na","<","9",,"ug/g","Mg","<","1",,"ug/g","Al","
<","1",,"ug/g","K","<","10",,"ug/g","Ca","<","6",,"ug/g","Sc","
<","0.1",,"ug/g","Ti","<","1",,"ug/g","V","<","2",,"ug/g","Cr","
<","5",,"ug/g","Mn",,"0.15",,"ug/g","Fe",,"60.6",,"ug/g","Co","
<","1",,"ug/g","Ni","
<","5",,"ug/g","Cu",,"24.4",,"ug/g","Zn",,"2.5",,"ug/g","Ga","
<","0.3",,"ug/g","As","<","0.2",,"ug/g","Se","<","0.3",,"ug/g","Rb","
<","0.1",,"ug/g","Sr","<","0.09",,"ug/g","Y","
<","0.002",,"ug/g","Zr","<","0.007",,"ug/g","Nb","
<","0.006",,"ug/g","Mo","<","0.3",,"ug/g","Rh","
<","0.006",,"ug/g","Pd","
<","0.03",,"ug/g","Ag",,"231",,"ug/g","Cd","<","0.04",,"ug/g","Sb","
<","37",,"ug/g","Te","<","0.03",,"ug/g","Cs","<","4",,"ug/g","La","
<","0.6",,"ug/g","Ce","<","0.5",,"ug/g","Pr","<","0.6",,"ug/g","Nd","
<","0.01",,"ug/g","Sm","<","0.03",,"ug/g","Eu","
<","0.05",,"ug/g","Gd","<","0.02",,"ug/g","Tb","
```

Tin, LANL
Tin, Canberra

Progress and Plans

- At SMU we have been trying to install the package.
  - CouchDB installs without problems
  - The other packages have various issues that we are still working to resolve.
- We are putting together a small group of people to assess the feasibility of using the LBF database and model on a larger scale. (technical)
- If successful, we plan to open the working group to a larger number of people to plan the database and write a white paper on the project.