PetDB Tutorial

April 2019

Annika Johansson

Petrological Database
http://www.earthchem.org/petdb, info@petdb.org

Table of Contents

Getting Started	2
Querying by:	
Location	3
Latitude/Longitude	3
Feature Name	4
Sample Type	5
Selecting Materials	5
Configuring Output	6
Chemistry/Chemical Range	8
Tectonic Setting	10
Age	10
Reference/Data Set	11
Cruise/Field Program	13
IGSN	14
Combining Search Criteria	15
Downloading Data	16
Selecting Individual vs Pre-Compiled Analyses	17
Feedback	19

Overview

PetDB (http://www.earthchem.org/petdb) is a global synthesis of chemical, isotopic, and mineralogical data for rocks, minerals, and melt inclusions. PetDB's current content focuses on data for

- igneous and metamorphic rocks from the ocean floor, specifically mid-ocean ridge basalts and abyssal peridotites, including those from ophiolites.
- xenolith samples from the Earth's mantle and lower crust.

Getting Started

Go to http://www.earthchem.org/petdb. To begin a query, click on the Search PetDB link on the PetDB homepage, or go to http://www.earthchem.org/petdb/search. You can create a query in PetDB by specifying one or more parameters. With each additional parameter, PetDB will retrieve the number of samples that possess the attributes chosen. Once you have selected a parameter and click 'Submit', you will return to the main search page, where selected criteria will be listed along with the number of samples that fit them.

You can then choose to:

- Download the Data
- View Samples on a Map
- View All Samples fitting your criteria
- View all References for these samples
- Access additional visualization tools ('Other Output Options').

Below is a description of each criterion you can define during sample selection and instructions on how to navigate the query interface. To learn how to download a dataset see the 'Selecting Chemical Data and Downloading Options' chapter of the tutorial.

Querying by Location

By Location

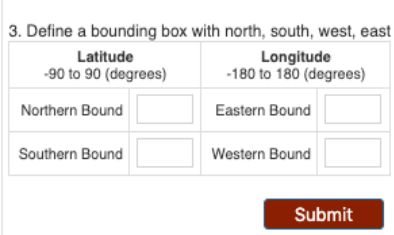
To query by location, you may define geospatial coordinates (latitude/longitude) in a number of ways.

Define a polygon on interactive map

1. Define a polygon on an interactive map.

Click the picture (southern polar map functions are identical) and the interactive map will appear. Click on the map to define a search polygon. Click on each vertex of the polygon, double-click on the last vertex to close the shape. You can zoom in/out using the +/- function. Use shift-click to create a smooth polygon with many vertices. Select 'Submit' and you will be returned to the search page with results listed in the right-hand box.

Define a bounding box



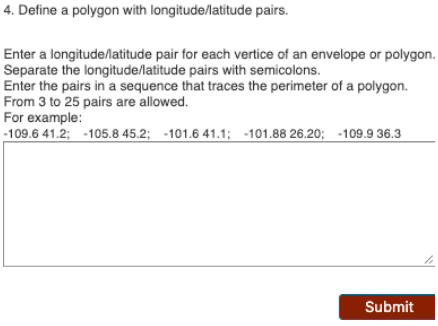
3. Define a bounding box with north, south, west, east

Latitude -90 to 90 (degrees)		Longitude -180 to 180 (degrees)	
Northern Bound		Eastern Bound	
Southern Bound		Western Bound	

Submit

Enter latitude and/or longitude of the geographical area you are interested in. Enter the Northern and Southern bounding latitudes (latitudes on the southern hemisphere need to be entered as negative values, e.g. 9.6°S = -9.6) and the Western and Eastern longitudes (Western longitudes need to be entered as negative values, e.g. 112°W = -112). Select 'Submit' and you will be returned to the search page with results listed in the right-hand box.

Define a polygon using lat/long pairs



4. Define a polygon with longitude/latitude pairs.

Enter a longitude/latitude pair for each vertice of an envelope or polygon.
Separate the longitude/latitude pairs with semicolons.
Enter the pairs in a sequence that traces the perimeter of a polygon.
From 3 to 25 pairs are allowed.
For example:
-109.6 41.2; -105.8 45.2; -101.6 41.1; -101.88 26.20; -109.9 36.3

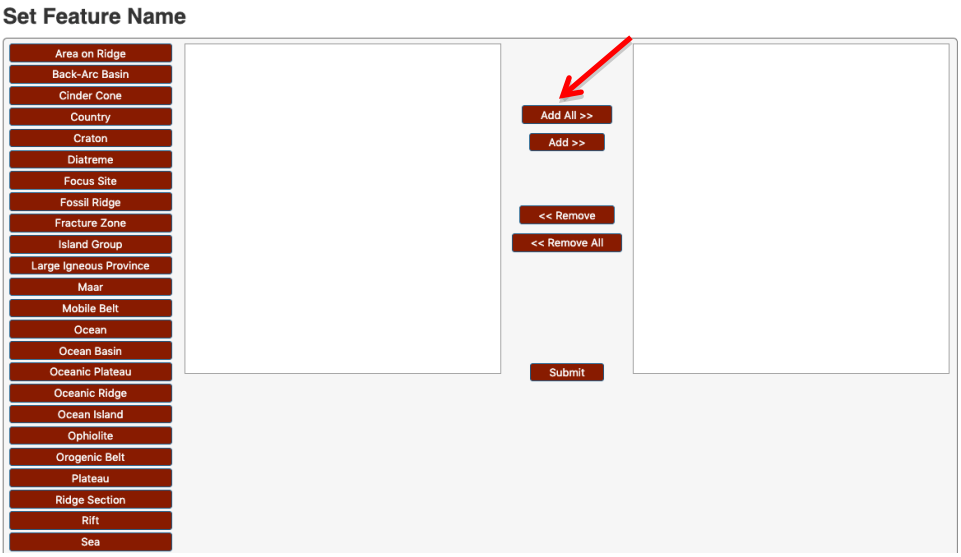
Submit

If at any time you wish to return to the search page to start a different search simply click ‘New Search’ in the banner.

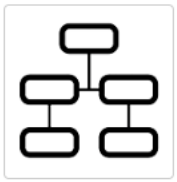
Querying by Feature Name

By Feature

To query samples by the name of an area or by type of geographic feature, search by feature name, and select the desired names. Note that it is possible to select from more than one Feature Name grouping. Geographical names are used on various regional scales ranging from names of oceans to the names of seamounts, platforms, fracture zones, and volcanoes. Click on ‘Add’ or ‘Add All’ to make your selection, then click ‘Submit’ to set the query parameter.

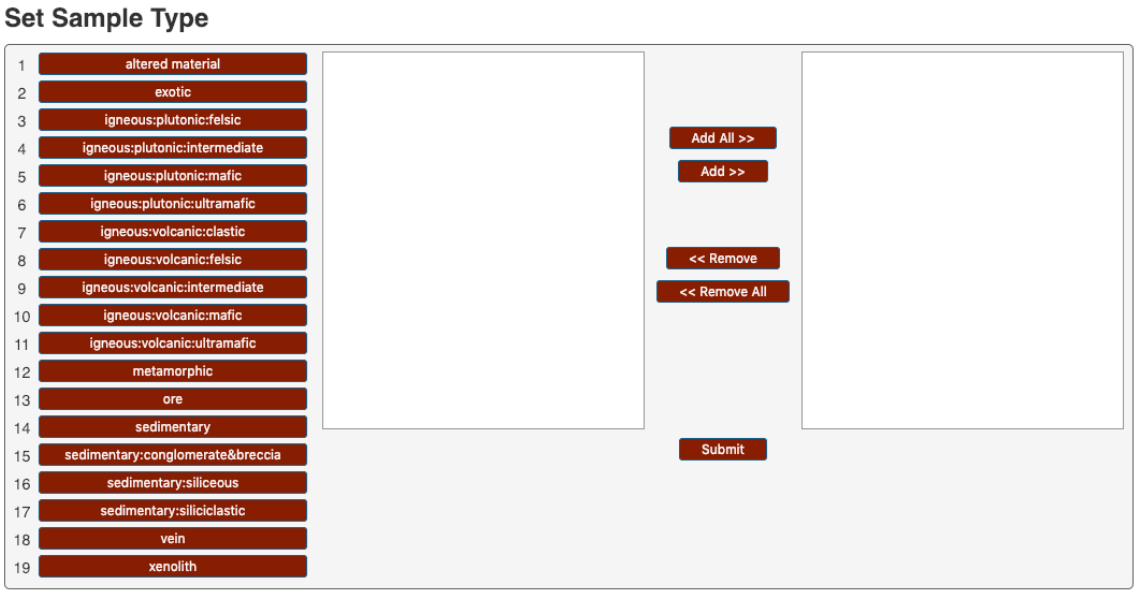


Querying by Sample Type



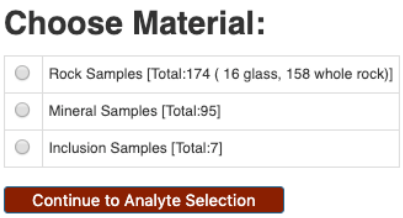
By Sample Type

Clicking on a rock type will display a list of rock classes in the selection box. Please note that 'rock class' is based primarily on classification information provided in the source publications and is NOT an interpretation of data by PetDB.

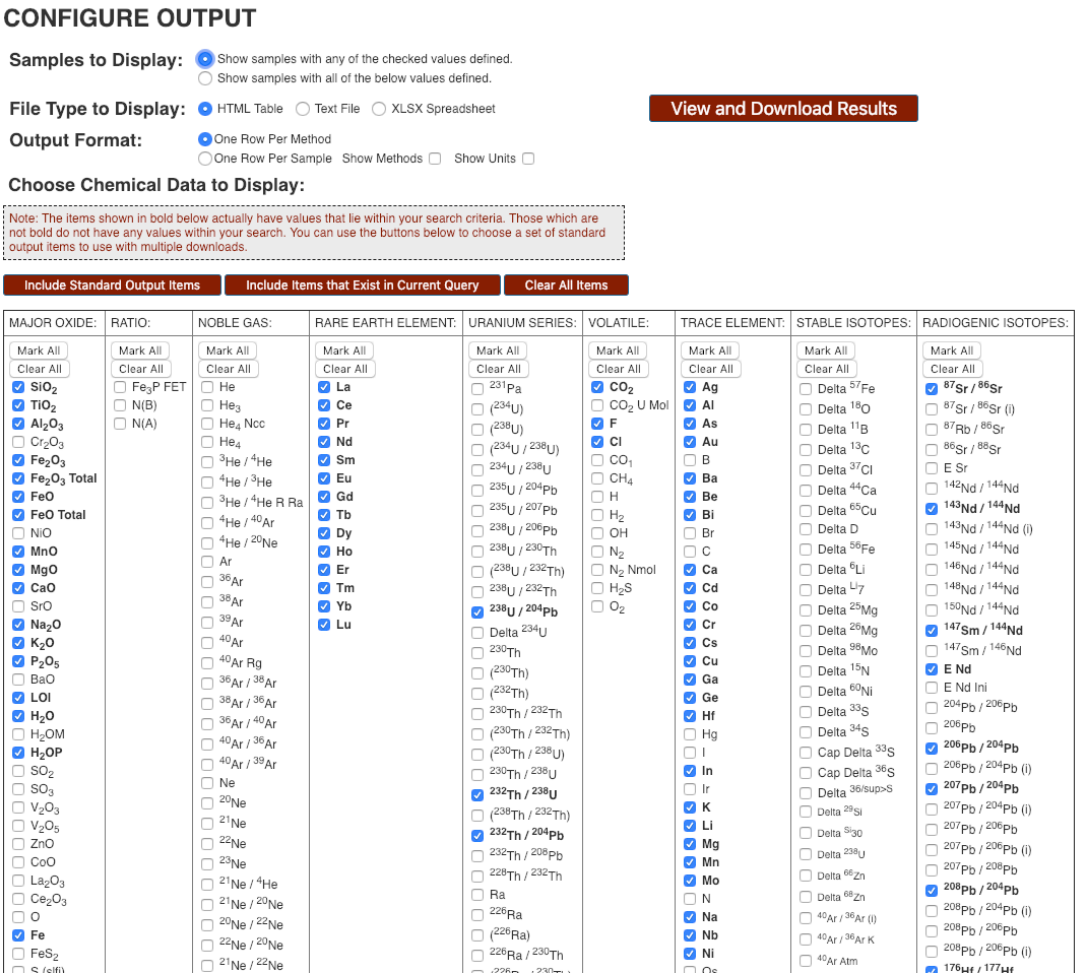


Selecting Materials

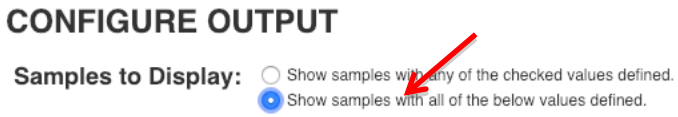
After selecting samples, click 'Download Data', then delimit the material of interest (Rock, Mineral, or Inclusion).



Clicking 'Continue to Analyte Selection' will bring you to a page to select chemical elements of interest and output configuration. Bold text indicates the analytes for which there is data for any of the samples. You can refine/update your selection by deselecting items. If you select 'Mineral Samples' a drop down menu of mineral species will appear.



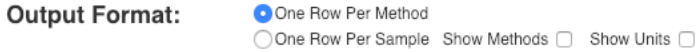
If you wish to see only see samples which have **all** the selected analytes, toggle the radio button to 'Show samples with all of the below values defined'



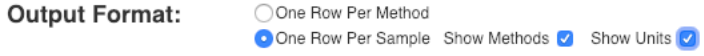
Output Options

PetDB gives you the option to choose desired type of file: HTML Table, Text File, or XLSX Spreadsheet:

Output formats offered are 'One Row Per Method', where a sample analyzed by multiple methods will show each line of data on a separate row.



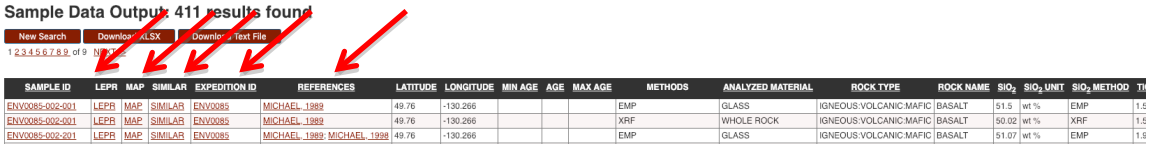
Or output as 'One Row Per Sample', where data for the same sample but from various methods will be concatenated into one row. Check boxes provide the option to display methods and units.



For more details see the 'Selecting Individual vs Pre-Compiled Analyses' section further below.

Once all selections are made click 'View and Download Results'

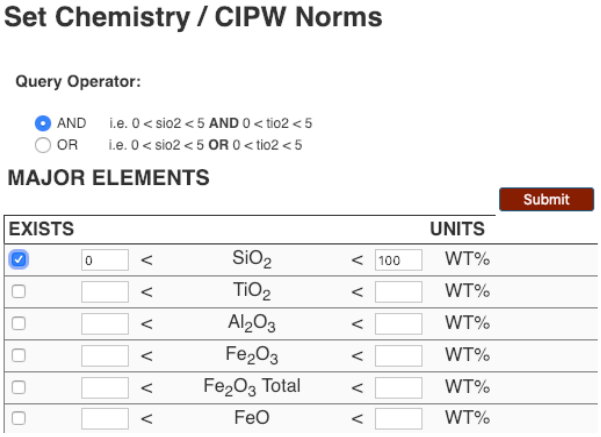
In addition to the data, the HTML output table contains links to metadata such as the Sample ID page, find similar samples in LEPR, a map display, find similar samples in PetDB, Expedition ID page, and references from which the data came. All of these selections either open a new tab, or display on top of the selection, so your underlying search is not lost.



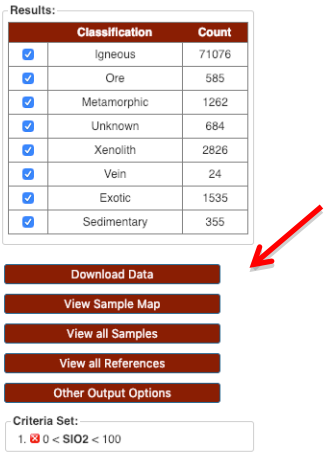
Querying by Chemistry

By Chemistry

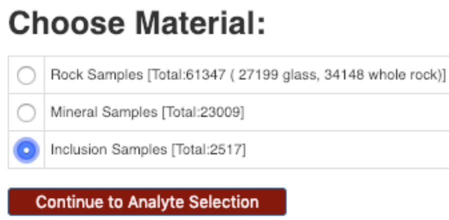
Use this filter to select samples by setting a min/max range of chemical values.



Check the box to the left of an analyte, define the desired range and click 'Submit'. This queries **all** samples with values of an analyte, regardless of rock type or location.
For example, selecting SiO2 across the full range of values yields samples from 8 different classifications.



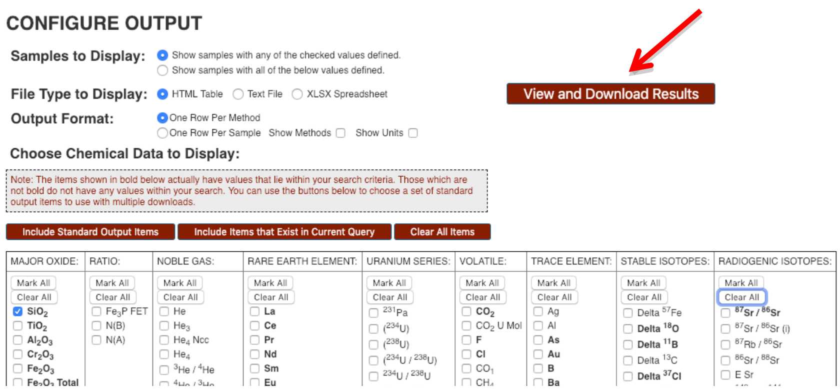
Clicking 'download data' will provide a view to select desired material.



On the next page **all** chemical analytes, in addition to the chosen SiO2, for the samples will be displayed. This gives users a broader view of available data. Users can select and deselect analytes of interest.

Clicking 'Mark All' or 'Clear All' provides a quick way to make further selections. Items can also be selected/deselected one-by-one using the check boxes.

Once the selection process is complete click 'View and Download Results'



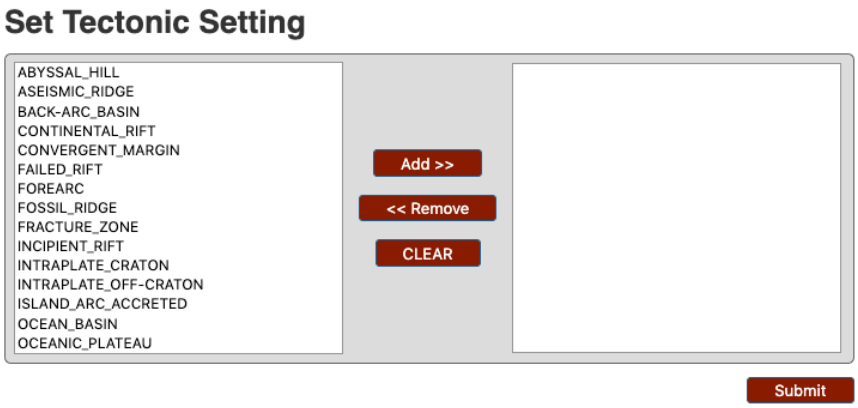
The resulting HTML file summarizes the results and the data can now be downloaded in the user's preferred format.

SAMPLE ID	IGSN	LEPR	MELTS	MAP	SIMILAR	REFERENCE	EXPEDITION ID	LATITUDE	LONGITUDE	MIN AGE	AGE	MAX AGE	METHOD	ANALYZED MATERIAL	ROCK TYPE
09N039W-UDM-HOST				MAP		SOBOLEV, 1993	nr	9	-39.5				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
09N039W-UDM-HOST				MAP		SOBOLEV, 1993	nr	9	-39.5				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
09N039W-UDM-HOST				MAP		SOBOLEV, 1993	nr	9	-39.5				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
09N039W-UDM-HOST				MAP		SOBOLEV, 1993	nr	9	-39.5				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
ABP0012-002-008A		LEPR	MELTS	MAP	SIMILAR	DMITRIEV, 1991	ABP0012	33.72	-38.56				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
ABP0012-019-001		LEPR	MELTS	MAP	SIMILAR	DMITRIEV, 1991	ABP0012	14.47	-45.13				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
ABP0012-032-004		LEPR	MELTS	MAP	SIMILAR	DMITRIEV, 1991	ABP0012	14.563	-44.975				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AGAVE-001-012-001		LEPR	MELTS	MAP	SIMILAR	SHAW, 2010	AGAVE	85.6263	85.2398				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AGAVE-001-013-001		LEPR	MELTS	MAP	SIMILAR	SHAW, 2010	AGAVE	85.6138	85.3547				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0032-3-011-177				MAP		KAMENETSKY, 1998	AII0032-3	42.955	-29.258				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0032-3-011-177		LEPR	MELTS	MAP	SIMILAR	KAMENETSKY, 1998	AII0032-3	42.955	-29.258				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0093-6-011-006		LEPR	MELTS	MAP	SIMILAR	PRICE, 1986	AII0093-6	-24.675	70.045				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0093-6-011-007		LEPR	MELTS	MAP	SIMILAR	PRICE, 1986	AII0093-6	-24.675	70.045				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0093-6-011-016		LEPR	MELTS	MAP	SIMILAR	PRICE, 1986	AII0093-6	-24.675	70.045				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0093-6-013-001		LEPR	MELTS	MAP	SIMILAR	PRICE, 1986	AII0093-6	-25.78	70.183				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0093-6-013-003		LEPR	MELTS	MAP	SIMILAR	PRICE, 1986	AII0093-6	-25.78	70.183				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0112-24-004-001		LEPR	MELTS	MAP	SIMILAR	YONOVER, 1989	AII0112-24	2.35	-95.49				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC
AII0112-24-005-001		LEPR	MELTS	MAP	SIMILAR	YONOVER, 1989	AII0112-24	2.4	-95.53				EMP	INCLUSION	IGNEOUS:VOLCANIC:MAFIC

Querying by Tectonic Setting

By Tectonic Setting

Use this criterion to query samples from tectonic features such as 'Fracture Zones', 'Back-Arc Basins', or 'Seamounts'.



To add multiple tectonic settings click the selection, then use Add>> to move selection to the box on the right and click ‘Submit’.

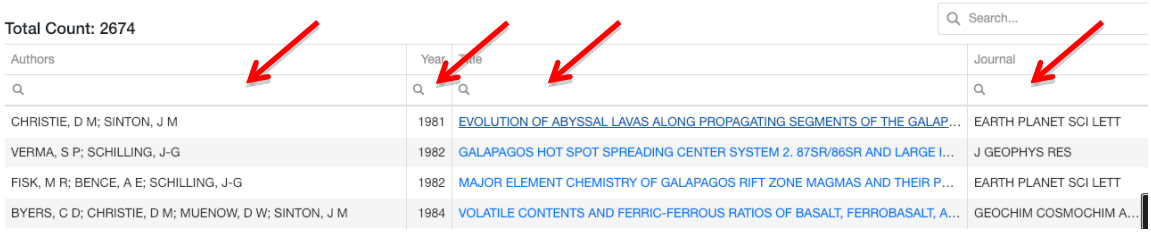
Querying by Age

By Age

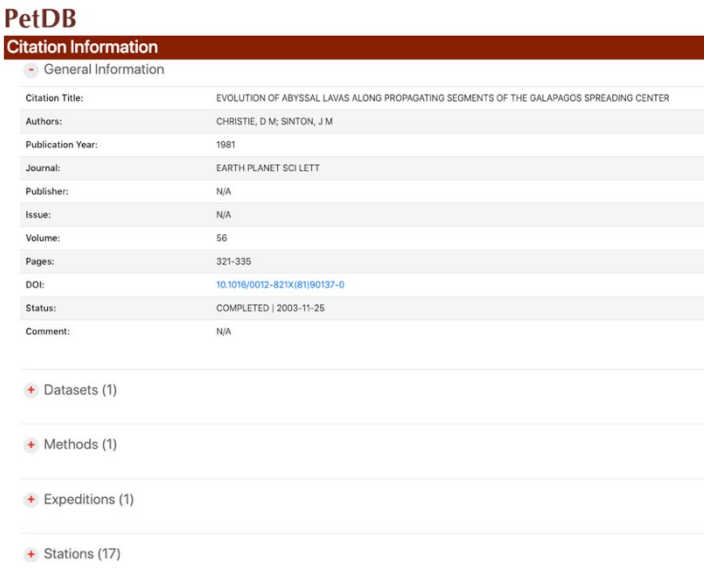
This query supports sample searches by: Age Span; Exact Age (in millions of years); Geological Age; or all samples for which an age determination exists.

Querying by Reference/Dataset Lookup

Under More Options 'Reference Lookup' can be done by Author, Publication Year, Title, or Journal. Click the top of any column to sort. Use the magnifiers to search for a specific item.



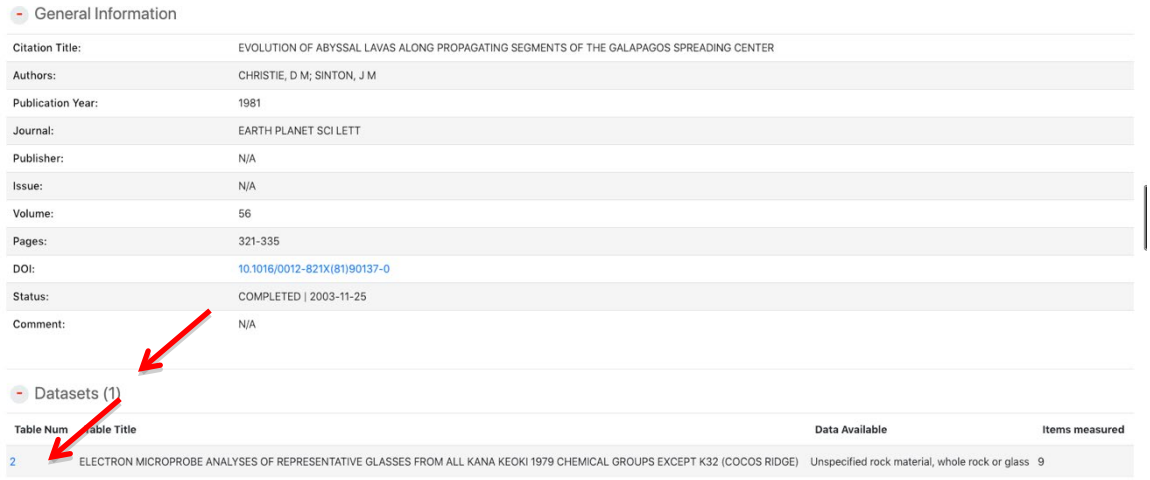
Click on any title to access the Citation Information page for that reference.



Clicking the doi link will take you to the publisher's page.

As you scroll down, metadata will be visible for datasets, methods, expeditions, stations, specimens, and items measured related to this publication. Click on any one of these to see more information.

Clicking on ‘Data Sets’ will display the table(s) from this publication.



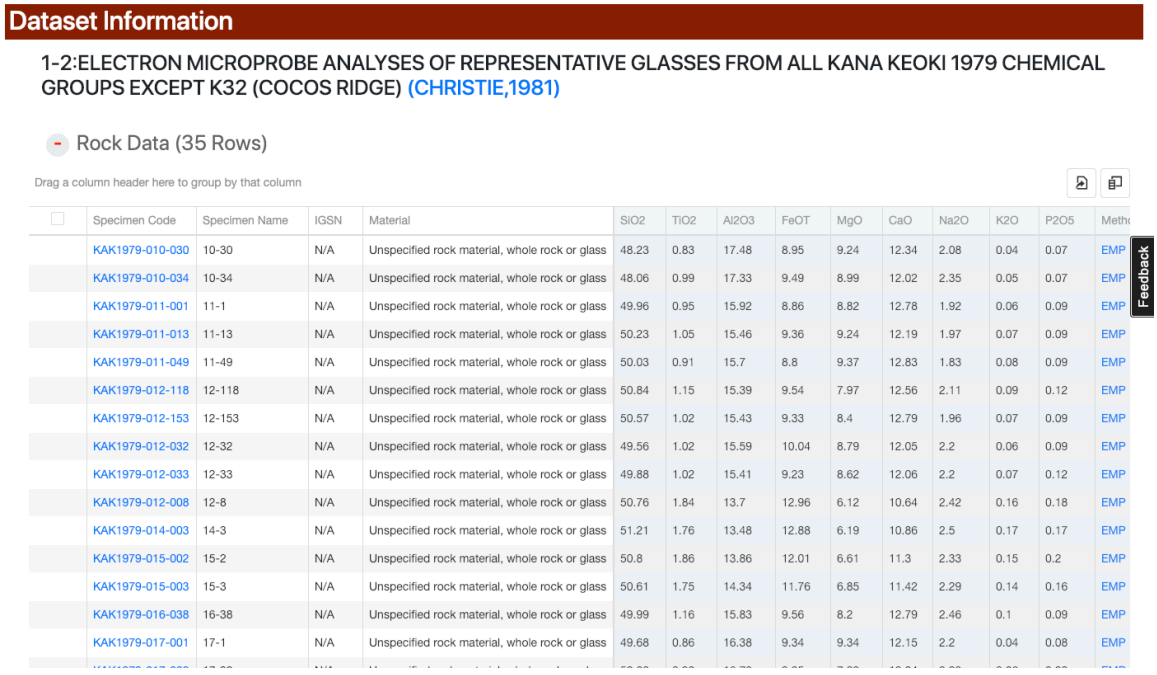
General Information

Citation Title:	EVOLUTION OF ABYSSAL LAVAS ALONG PROPAGATING SEGMENTS OF THE GALAPAGOS SPREADING CENTER
Authors:	CHRISTIE, D M; SINTON, J M
Publication Year:	1981
Journal:	EARTH PLANET SCI LETT
Publisher:	N/A
Issue:	N/A
Volume:	56
Pages:	321-335
DOI:	10.1016/0012-821X(81)90137-0
Status:	COMPLETED | 2003-11-25
Comment:	N/A

Datasets (1)

Table Num	Table Title	Data Available	Items measured
2	ELECTRON MICROPROBE ANALYSES OF REPRESENTATIVE GLASSES FROM ALL KANA KEOKI 1979 CHEMICAL GROUPS EXCEPT K32 (COCOS RIDGE)	Unspecified rock material, whole rock or glass	9

Clicking the highlighted number to the left of the table title will display the full data set.



Dataset Information

1-2:ELECTRON MICROPROBE ANALYSES OF REPRESENTATIVE GLASSES FROM ALL KANA KEOKI 1979 CHEMICAL GROUPS EXCEPT K32 (COCOS RIDGE) (CHRISTIE,1981)

Rock Data (35 Rows)

Drag a column header here to group by that column

Specimen Code	Specimen Name	IGSN	Material	SiO2	TiO2	Al2O3	FeOT	MgO	CaO	Na2O	K2O	P2O5	Meth
KAK1979-010-030	10-30	N/A	Unspecified rock material, whole rock or glass	48.23	0.83	17.48	8.95	9.24	12.34	2.08	0.04	0.07	EMP
KAK1979-010-034	10-34	N/A	Unspecified rock material, whole rock or glass	48.06	0.99	17.33	9.49	8.99	12.02	2.35	0.05	0.07	EMP
KAK1979-011-001	11-1	N/A	Unspecified rock material, whole rock or glass	49.96	0.95	15.92	8.86	8.82	12.78	1.92	0.06	0.09	EMP
KAK1979-011-013	11-13	N/A	Unspecified rock material, whole rock or glass	50.23	1.05	15.46	9.36	9.24	12.19	1.97	0.07	0.09	EMP
KAK1979-011-049	11-49	N/A	Unspecified rock material, whole rock or glass	50.03	0.91	15.7	8.8	9.37	12.83	1.83	0.08	0.09	EMP
KAK1979-012-118	12-118	N/A	Unspecified rock material, whole rock or glass	50.84	1.15	15.39	9.54	7.97	12.56	2.11	0.09	0.12	EMP
KAK1979-012-153	12-153	N/A	Unspecified rock material, whole rock or glass	50.57	1.02	15.43	9.33	8.4	12.79	1.96	0.07	0.09	EMP
KAK1979-012-032	12-32	N/A	Unspecified rock material, whole rock or glass	49.56	1.02	15.59	10.04	8.79	12.05	2.2	0.06	0.09	EMP
KAK1979-012-033	12-33	N/A	Unspecified rock material, whole rock or glass	49.88	1.02	15.41	9.23	8.62	12.06	2.2	0.07	0.12	EMP
KAK1979-012-008	12-8	N/A	Unspecified rock material, whole rock or glass	50.76	1.84	13.7	12.96	6.12	10.64	2.42	0.16	0.18	EMP
KAK1979-014-003	14-3	N/A	Unspecified rock material, whole rock or glass	51.21	1.76	13.48	12.88	6.19	10.86	2.5	0.17	0.17	EMP
KAK1979-015-002	15-2	N/A	Unspecified rock material, whole rock or glass	50.8	1.86	13.86	12.01	6.61	11.3	2.33	0.15	0.2	EMP
KAK1979-015-003	15-3	N/A	Unspecified rock material, whole rock or glass	50.61	1.75	14.34	11.76	6.85	11.42	2.29	0.14	0.16	EMP
KAK1979-016-038	16-38	N/A	Unspecified rock material, whole rock or glass	49.99	1.16	15.83	9.56	8.2	12.79	2.46	0.1	0.09	EMP
KAK1979-017-001	17-1	N/A	Unspecified rock material, whole rock or glass	49.68	0.86	16.38	9.34	9.34	12.15	2.2	0.04	0.08	EMP

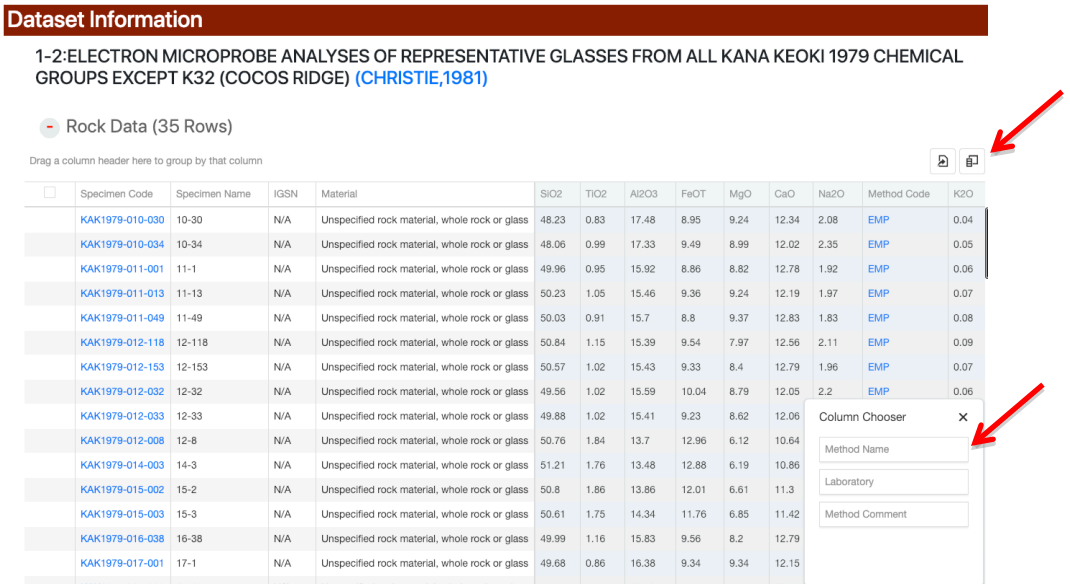
Feedback

*Note: The data tables contain only values that are original to the reference publication and which have not been reported in other publications. Referenced values can be found in the original publications in which the data appeared.

Data from a table can be directly downloaded by selecting the Export Icon on the right

From here you can export all data or select rows by checking the box(es) to the left of the Specimen Code.

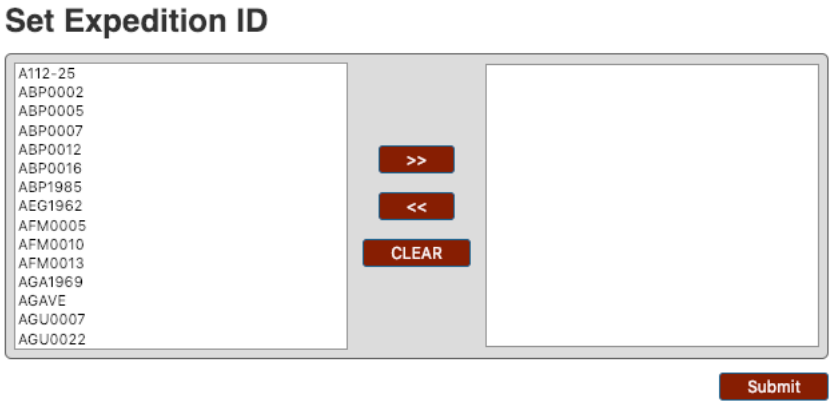
If you wish to limit the columns in the data set table click the 'Column Chooser' icon. Drag columns you wish to hide into the pop-up box. To undo, simply drag the column heading back onto the data table. Columns in the box will not be included in the download.



Query by a specific Cruise or Field Program

By Cruise or Field Program

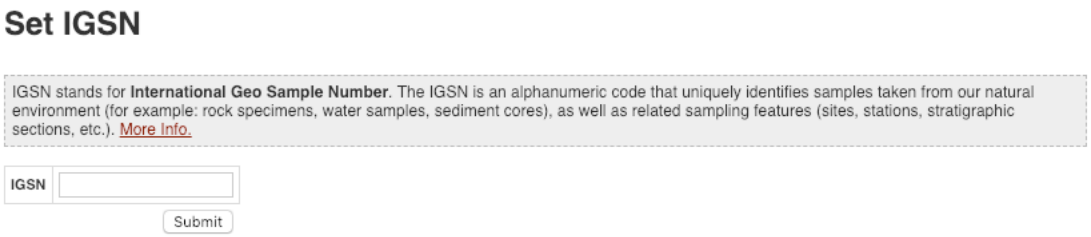
You can search for samples by the PetDB unique expedition identifier. PetDB Expedition IDs contain names in an alphanumeric structure.



Search by International Geo Sample Number (IGSN)

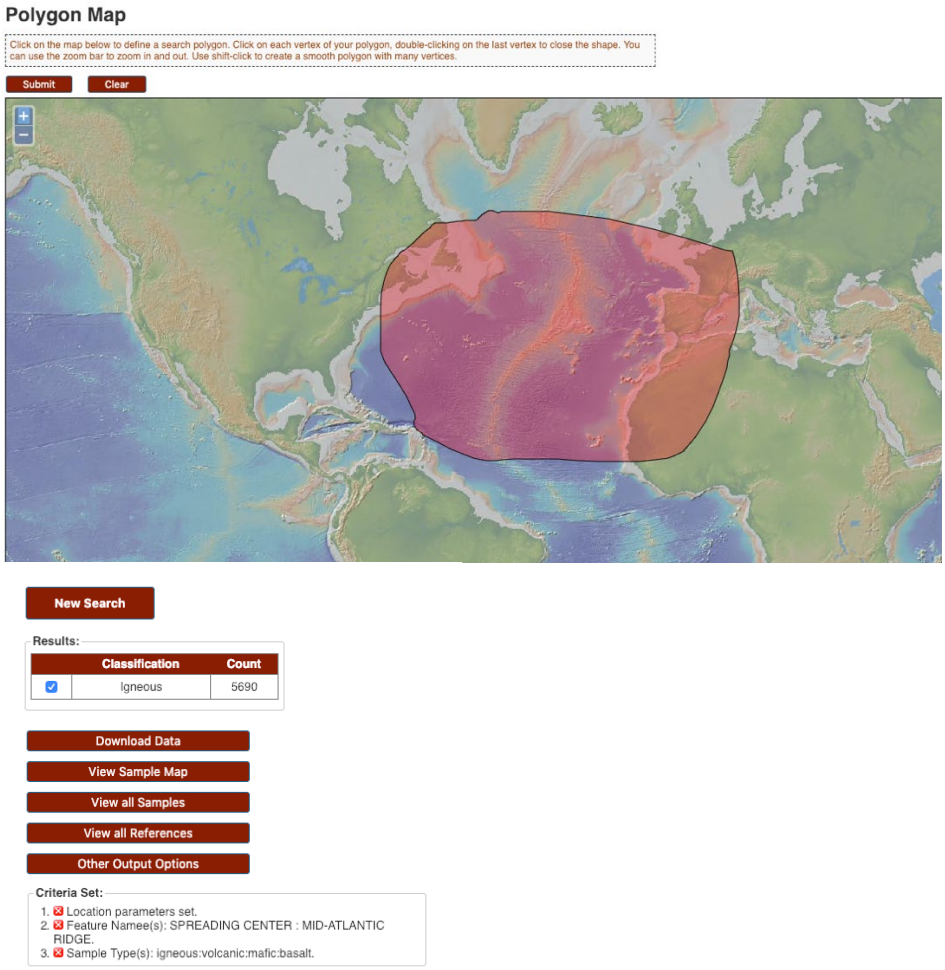
By IGSN

The IGSN is an alphanumeric code which uniquely identifies samples, sites, stations etc. Enter any known IGSN into the box, and click 'Submit'. Please note: current efforts are underway to significantly increase the number of samples searchable by IGSN.



Combining Search Criteria

The new PetDB Search has the enhanced capability to combine any number of search parameters. For example, it is possible to define a location using the map polygon, adding the name of a feature, and finally selecting a specific rock type. With each criterion added, the number of samples available will adjust to show those fitting all selected criteria. Below is an example of the results from drawing a polygon in the N. Atlantic, selecting the Mid-Atlantic Ridge, and finally basalt as the rock type.



Downloading Data

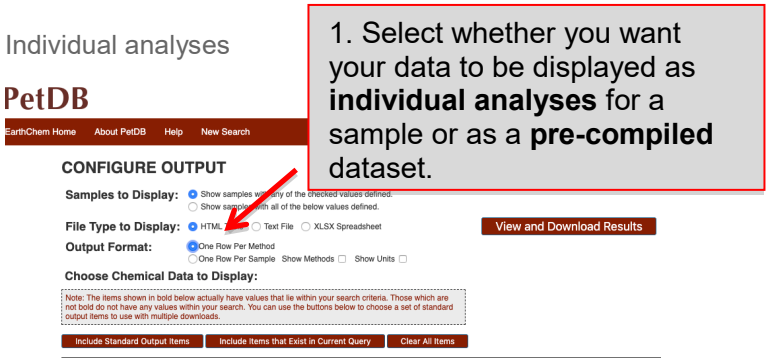
From all of the search icons on the search page downloading data is just a few clicks away. Once you have delimited your sample selection:

- Click Download Data
- Choose Material
- Select Analytes
- View and Download Results
- Choose download format

Excel downloads include 2 tabs. The 'Data' tab has metadata such as reference information, geospatial data, methods, material and classification in addition to the chemical data itself. The 'Reference' tab lists author(s), year, title and journal for the data *in your download*.

Selecting Individual vs Pre-Compiled Analyses

Individual analyses



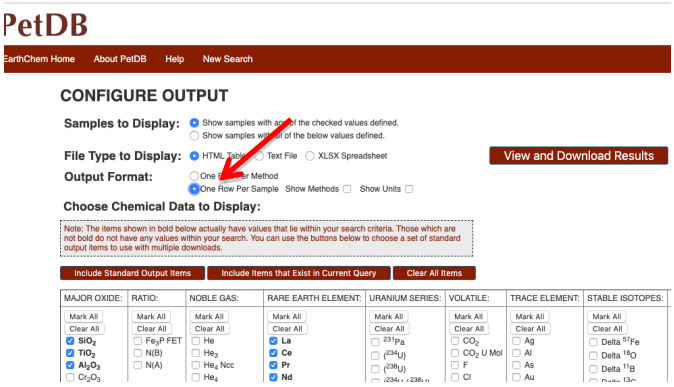
This option will return a data table that contains all analytical values available for the samples and for the chemical parameters you selected organized by reference and method. This means that each individual row of the result table will contain only those analytical values for a sample that were analyzed with the same method and reported in same reference.

If you select 'Individual Analyses', you will get a table that lists all analyses available for the samples and for the chemical items you selected organized by reference and method. If multiple measurements have been made for a certain chemical item on the same sample (e.g. Nb measured by different methods and published in different papers), they will all be listed in the table. One row in the data table will only contain values from one publication and only data acquired by the same method. *A table with individual analyses will generally report data for the same sample in multiple rows.*

Sample	Majors	H2O	Nb	Rb	Sr	87Sr/86Sr	143Nd/144Nd	Method	Reference
A	XX							XRF	1
B	YY							XRF	1
C	ZZ							XRF	1
A		0.5						WET	1
B		0.4						WET	1
C		0.7						WET	1
A			0.3	2	98			ICPMS	2
B			0.6	1.5	76			ICPMS	2
C			0.5	1.7	82			ICPMS	2
A						0.70305	0.51211	MS	3

B						0.70298	0.51193	MS	3
C						0.70311	0.51205	MS	3
A				1.98	96.8			MS-ID	3
B				1.45	74.2			MS-ID	3
C				1.80	83.5			MS-ID	3

Pre-compiled



This option will return a data table with only one row for each sample that contains a compilation of analytical values measured by different methods or reported in different references. If multiple values for the same chemical parameter exist, one of the values is selected on the basis of rules that we established (see below).

Example: You selected major elements, Nb, Rb, and Sr concentrations, and Sr and Nd isotope ratios for samples A, B, and C. Major elements analyzed by XRF and wet chemistry for these samples were published in reference 1, the trace elements analyzed by ICP-MS in reference 2, isotope ratios by mass spectrometry and Sr and Rb by isotope dilution MS in reference 3.

Sample	Majors	H2O	Nb	Rb	Sr	87Sr/86Sr	143Nd/144Nd	Method	Reference
A	XX	0.5	0.3	1.98	96.8	0.70305	0.51211	XRF,ICPMS, etc	1,2,3
B	YY	0.4	0.6	1.45	74.2	0.70298	0.51193	XRF,ICPMS, etc	1,2,3
C	ZZ	0.7	0.5	1.80	83.5	0.70311	0.51205	XRF,ICPMS, etc	1,2,3

Rules of Data Selection for Pre-Compilation

For isotope ratios:

1. Publication year is compared. The latest value has the highest priority
2. If there is more than one value published in the latest year, standard deviation is used as criteria.

For major elements, rare earth elements and other trace elements:

1. Method: choose the values with highest method priority.
2. If there is more than one value done by the same method (and which has the highest priority among all analyses for that element of that sample), then publication year is compared. The latest value has the highest priority

Method: listed below with priority from high to low.

Major elements:

- XRF: X-RAY FLUORESCENCE
- DCP: DIRECT CURRENT PLASMA
- WET: WET CHEMISTRY
- EMP: ELECTRON MICROPROBE
- ES: EMISSION SPECTROMETRY
- Other

Rare earth elements:

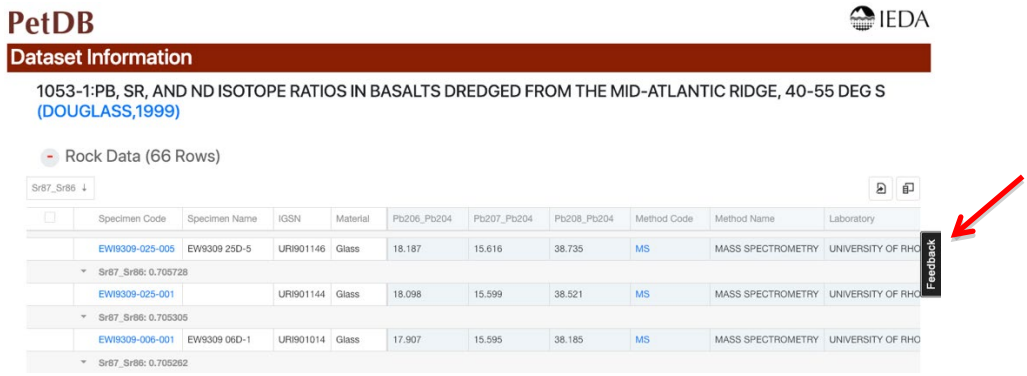
- MS-ID: ISOTOPE DILUTION MASS SPECTROMETRY
- MS: MASS SPECTROMETRY
- ICPMS: INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY
- DCP: DIRECT CURRENT PLASMA
- SSMS: SPARC SOURCE MASS SPECTROMETRY
- INAA: INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS
- Other

Other trace elements:

- MS-ID: ISOTOPE DILUTION MASS SPECTROMETRY
- MS: MASS SPECTROMETRY
- ICPMS: INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY
- SSMS: SPARC SOURCE MASS SPECTROMETRY

Feedback

To send Feedback click the black ‘Feedback tab on the right-hand side of a page and complete the feedback form.



If you have additional questions, please write to us at info@petdb.org.