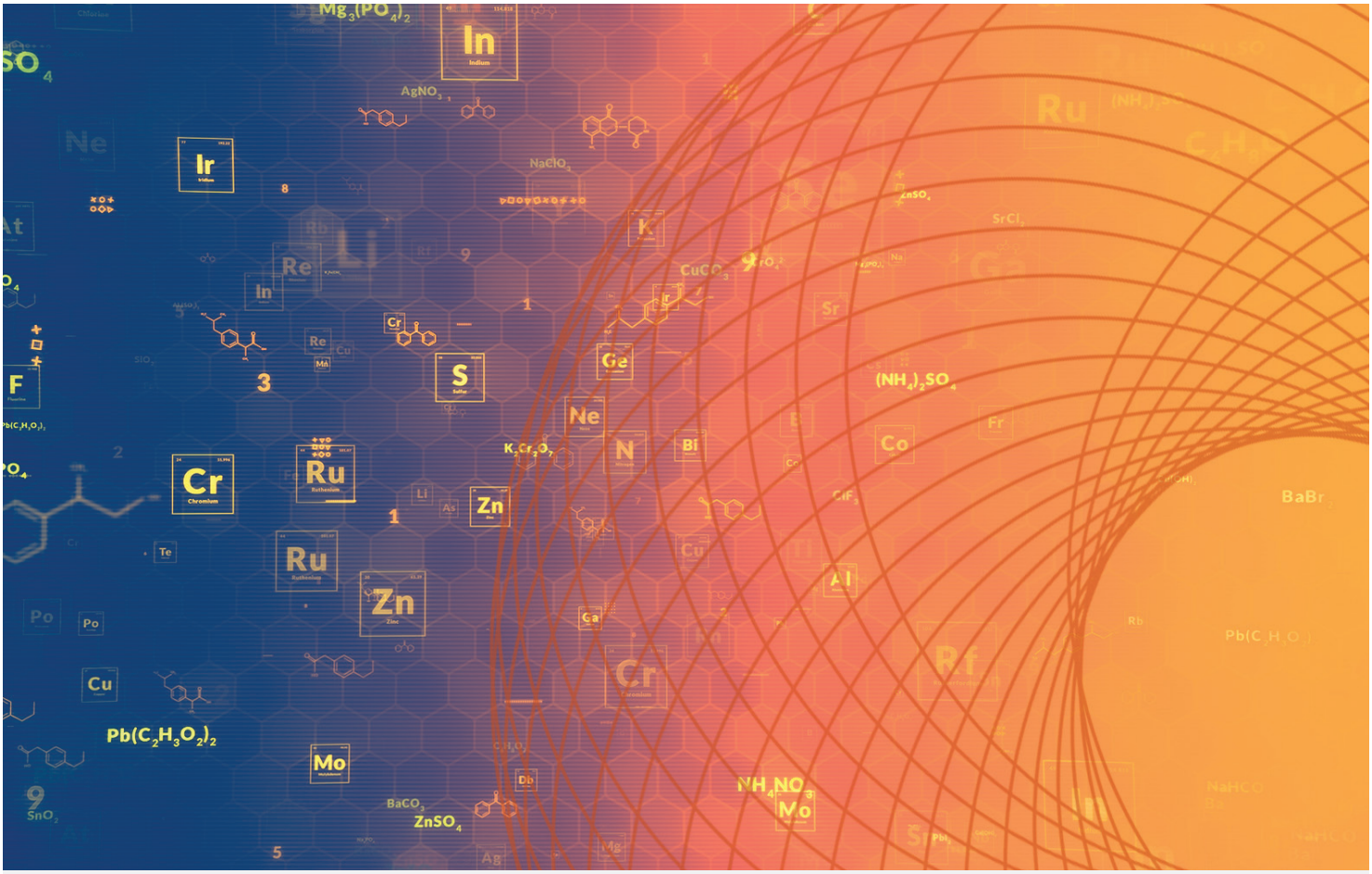


User Guide

Fast reliable insights accelerating materials science research

Your Quick Guide to SpringerMaterials

SpringerMaterials, one of the world's largest curated databases in materials science, takes center stage in scientific research. With an extensive collection of over 290,000 materials and 3,000+ physical and chemical properties, this comprehensive platform emerges as an indispensable asset for researchers in materials science, physics, chemistry, engineering, and beyond.

Whether you are an academic, a professional, an undergraduate or a researcher at every level, SpringerMaterials offers a wealth of curated data and advanced functionalities to propel your research to new heights.

This Quick Start Guide will demonstrate how property data can be identified quickly, how data can be used (e.g. download, manipulate, compare) in subsequent workflows and how data sets and diagrams are appropriately cited.

NB: This guide does not provide a complete overview of all functionalities, materials classes, and property information within the SpringerMaterials platform. For more information on how to use the platform, please contact your local SpringerMaterials product manager (see Contacts page).Access

SpringerMaterials can be accessed via materials.springer.com

The platform works on all major devices, desktops, and mobile devices. For smaller devices, e.g. iPhone or similar, some functionalities might be unavailable due to screen resolution and/or screen size. All major browsers are supported.

Users will need a valid license for SpringerMaterials, otherwise access to most of the content will be blocked.

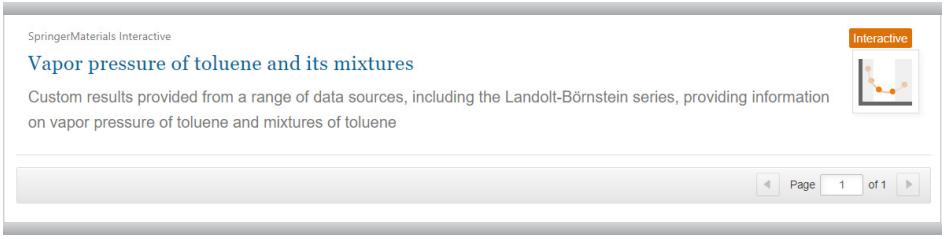
Tips for searching on SpringerMaterials

The best results will be achieved by

- Using a stepwise approach
- Searching for combinations of material(s) and properties

For example, if you are searching for a given materials-property combination (e.g. heat capacity of polyethylene), start your journey by searching for the material first (polyethylene) and subsequently refine by property (heat capacity). This approach allows you to better understand what the platform is doing and also avoids confusion in case the platform is unable to precisely interpret your query. All use cases below follow this guided principle.

SpringerMaterials is a smart technology, and will give you a preview of the content loaded behind each result retrieved. For example, when searching for the vapor pressure (property) of toluene (material), your first result indicates (in grey text) that it is from our SpringerMaterials Interactive module, and will be an interactive graph (per the icon to the right). This preview allows you to quickly scan the list of results to find exactly the format of data you need, and prevents you from wasting time clicking through unwanted results. It's that easy!



More Tips & Tricks

To request a special Tips & Tricks webinar, please contact your local SpringerMaterials product manager.

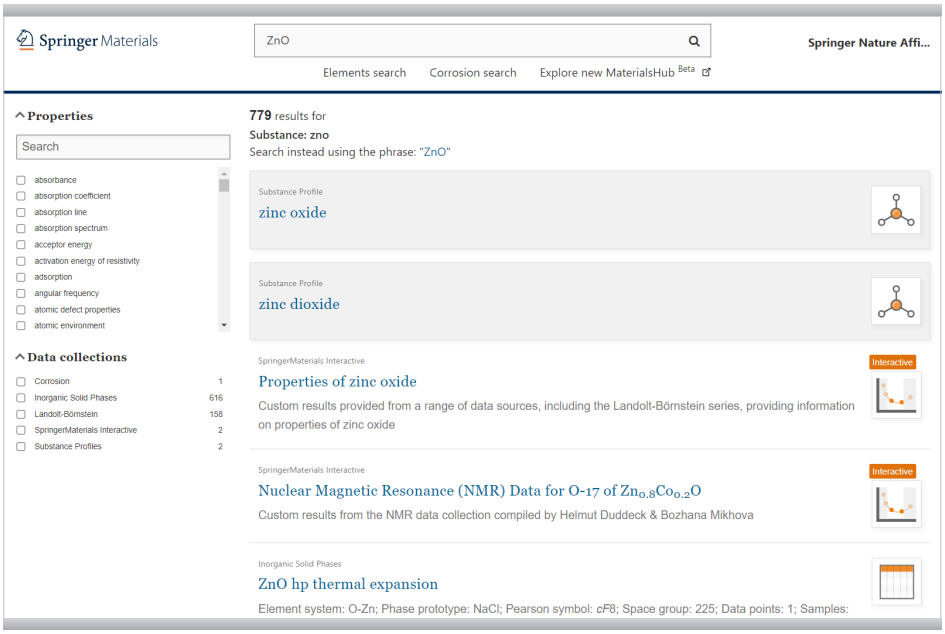
Example Searches

How to run a basic material & property search

Example: Find the ***Young's Modulus*** (=property) of ***ZnO*** (=material)

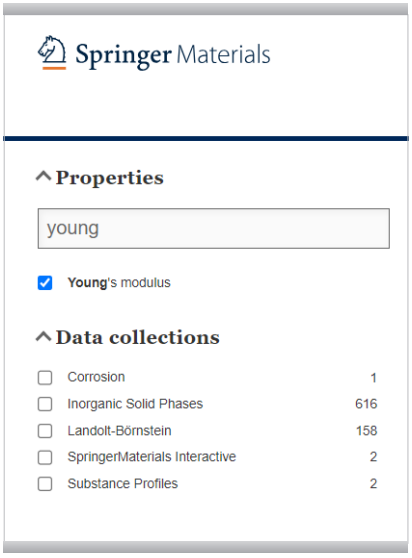
1) Go to materials.springer.com

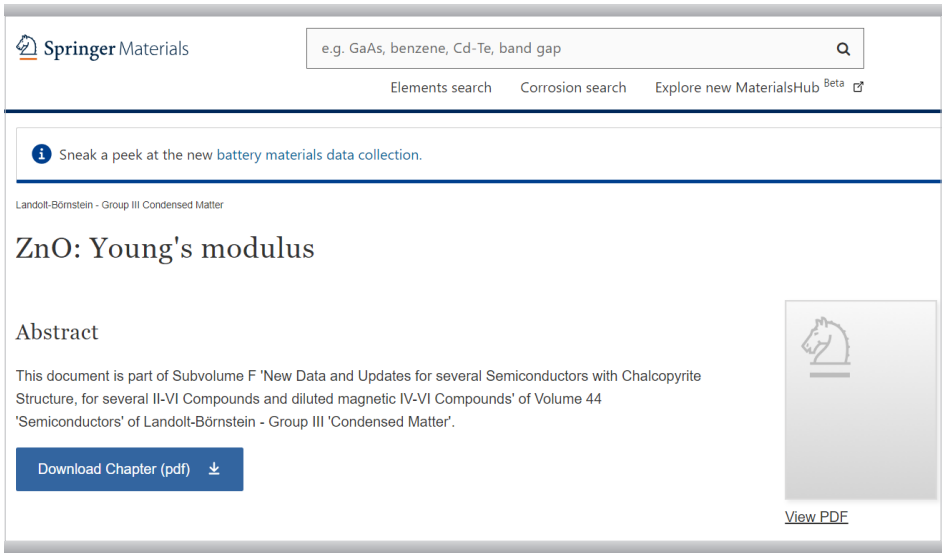
2) Enter "***ZnO***" in the search box. This will generate a list covering ZnO, at the time of writing 779 results.



3) To refine results type '***Young***' into the Properties list and select Young's modulus. This will generate a single result which can be clicked to open.

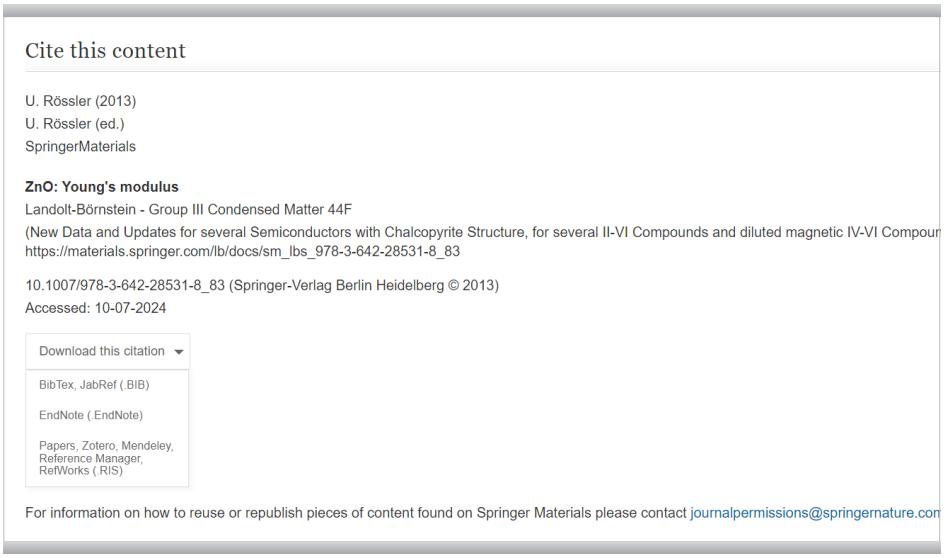
   This will show an overview of the content with a brief description and bibliographic information.





4) Click to ***download chapter*** or ***view PDF***

5) To correctly cite this document, scroll down to the bottom of the page and click the '***Download this citation***' button. This will copy the citation using common data formats like .BIB, .RIS or .EndNote.



How to find a crystal structure & customize a 3D image

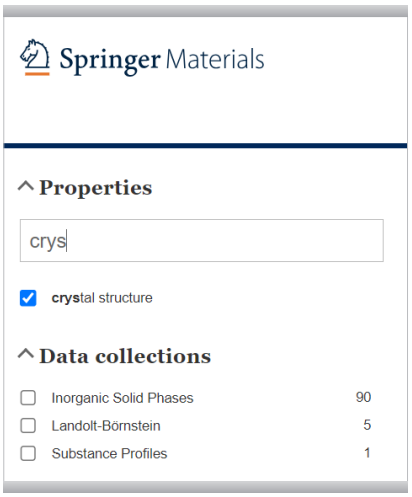
Example: Find the ***crystal structure*** (= property) of ***BaZrO3*** (= material), download a CIF file of the crystallographic data and customize a 3D image.

1) Go to materials.springer.com

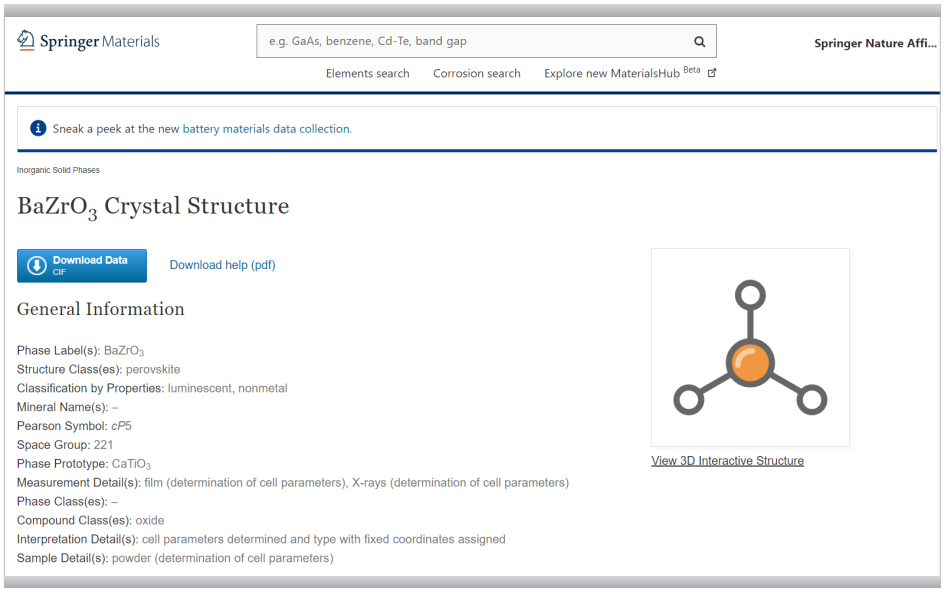
2) Enter "***BaZrO3***" in the search box. This will generate a list covering BaZrO3, at the time of writing 96 results.

3) To refine results start to type '***crystal structure***' into the Properties list and select the same. This will generate 71 results. Click on the first to open.

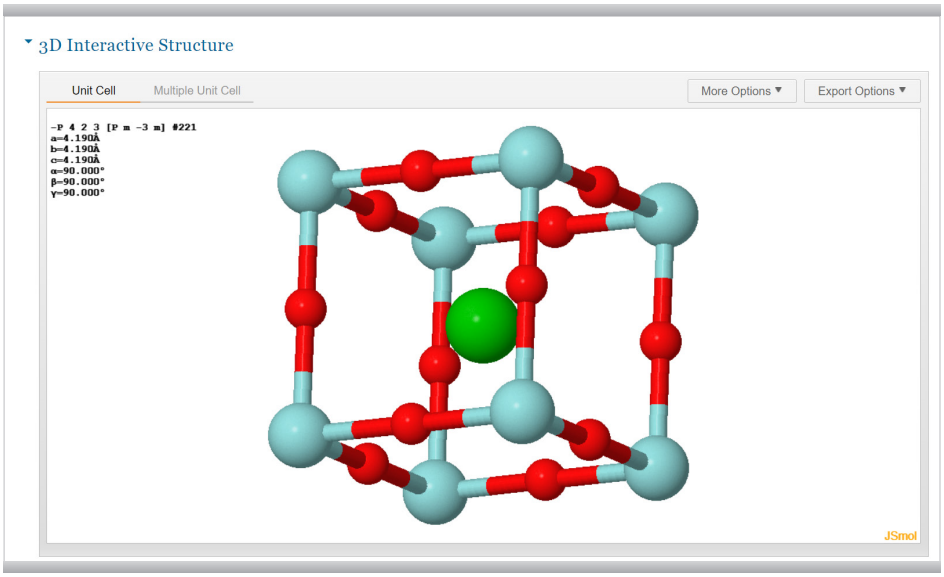
This will show an overview of the compound and general information about the data set.



4) For computational applications of crystal structure data, a convenient way to download CIF files is available in the upper left corner. Click Download Data CIF. For troubleshooting purposes, a PDF is available to the right of the download button explaining the data structure of a CIF file.



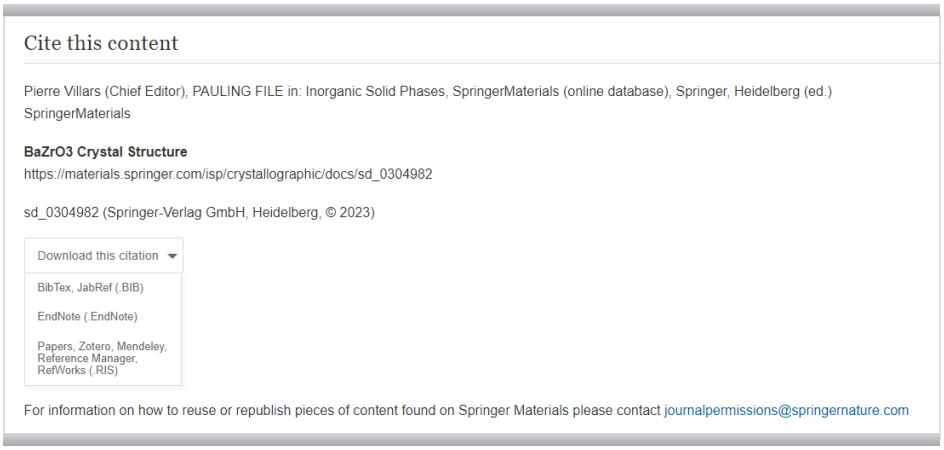
5) To view the interactive crystal structure, click '***View 3D Interactive Structure***'. Moving the cursor on the structure and scrolling allows you to zoom in and zoom out. Left click and hold, while moving your cursor allows you to rotate the structure. You can also toggle between Unit Cell and Multiple Unit Cell view.



6) Click ***More Options*** to select distance measurement or angle measurement.

7) Click ***Export Options*** to download a PNG or JPG file.

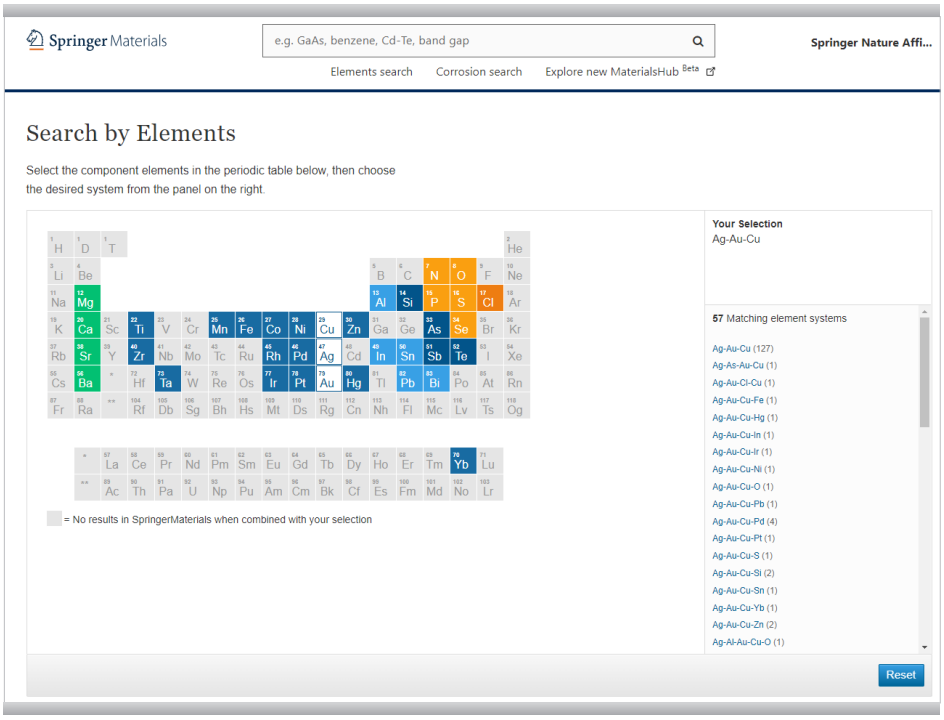
8) To correctly cite this document, scroll down to the bottom of the page and click the '***Download this citation***' button. This will copy the citation using common data formats like .BIB, .RIS or .EndNote.



How to use the Search by Elements feature & how to find a phase diagram

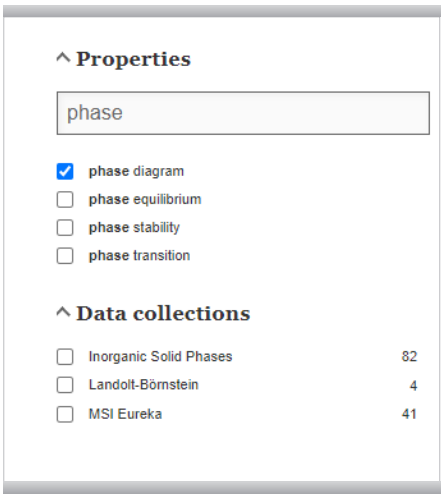
Example: Find a phase diagram, vertical section at 50 at.% Au (= property) of the ternary system Ag-Au-Cu (= material), customize the phase diagram, and find the phase diagram evaluation report.

1) Go to materials.springer.com



2) Select ***Search by Elements***

3) Select all elements which your system contains: "Ag", "Au" and "Cu". To the right of the table, a list of matching element systems will auto-populate with "Ag-Au-Cu" at the top. The number in brackets (127) shows the number of documents available for this element system.



4) Click on ***Ag-Au-Cu*** to see the list of documents.

5) To refine these results, select "***phase diagram***" from the Properties list on the left-hand side. To do this, you can scroll through the list or type "***phase diagram***" under the Properties box.

6) After refining by property, you end up with 109 results. Look at the headlines of the result list. The 3rd result is the phase diagram of choice, Vertical section at 50 at.% Au. Click to open.

7) Hovering your mouse over the phase diagram allows you to easily identify the composition and temperature at any given point on the diagram. Left mouse click on the

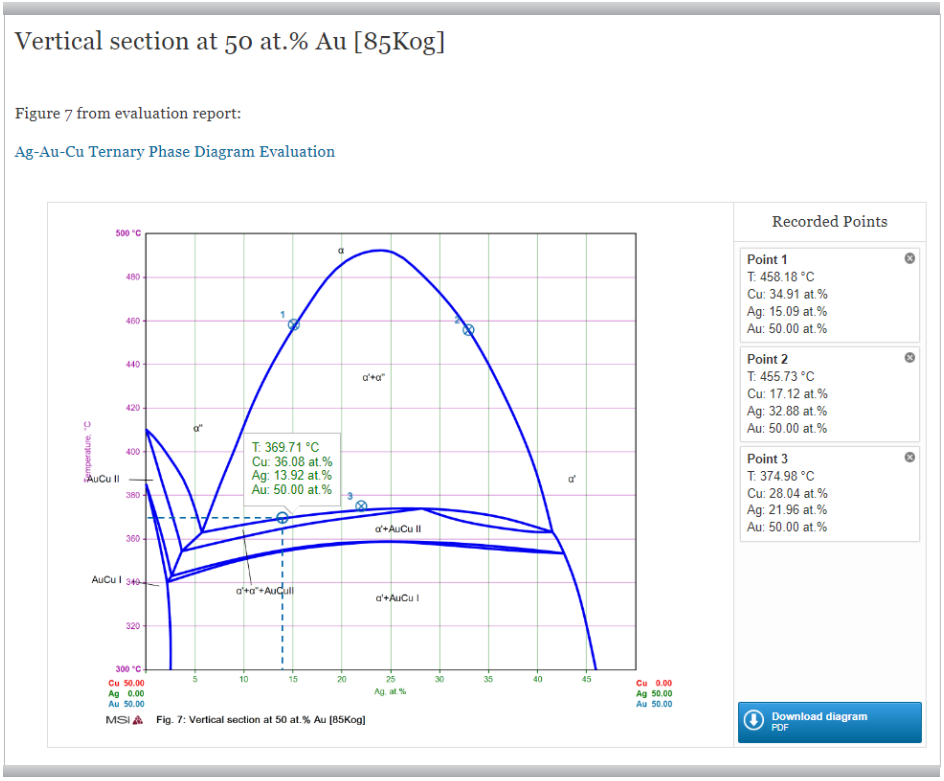


diagram to drop and record points of interest. All points are collected in the panel on the right-hand side. Download diagram allows you to store the customized diagram including the recorded points.

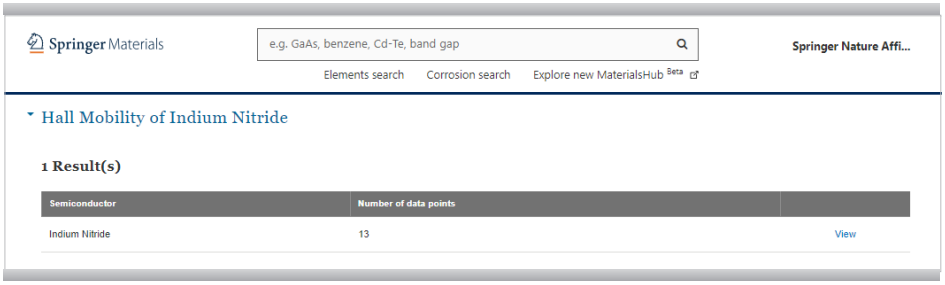
8) To access the evaluation report (from which the diagram has been taken), click on the link Ag-Au-Cu Ternary Phase Diagram Evaluation located at the top of the phase diagram.

9) To correctly cite this document, scroll down to the bottom of the page and click the '***Download this citation***' button. This will copy the citation using common data formats like .BIB, .RIS or .EndNote

How to search for & compare semiconductors using SpringerMaterials Interactive

Example: Find the Hall Mobility (= property) of InN (= material #1) and compare it with GaN (= material #2)

1) Go to materials.springer.com
2) Enter "***InN***" in the search box. This will generate a list covering InN, at the time of writing 131 results.
3) To refine the results scroll or start to type '***Hall mobility***' into the Properties list and select the same. This will generate a single result, click to open.
4) This will provide an overview of the avaliable content with a brief description of the data range. Click View to access the data for Indium Nitride (InN)



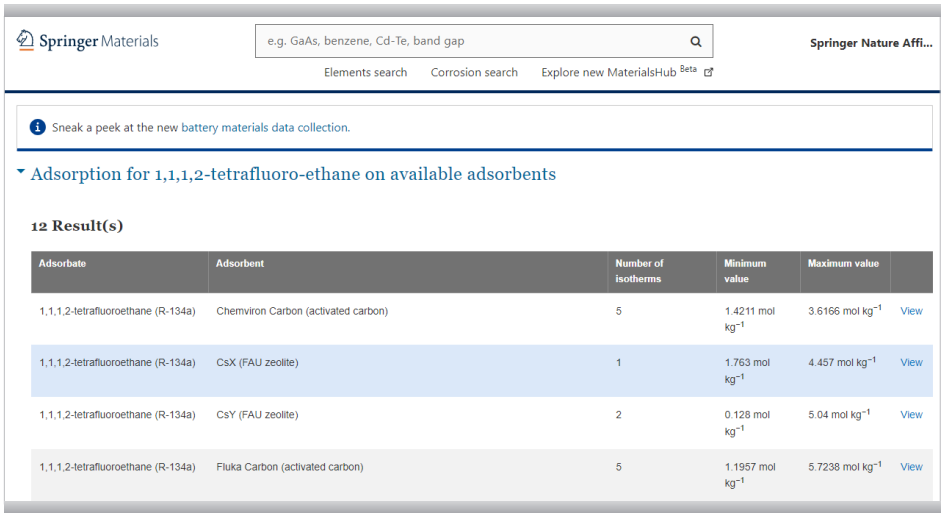
5) Now, you see a diagram containing 13 data points for this material/property combination depending on the temperature. Clicking on any one of the data points in the diagram provides the exact numbers for this given data point, shown in the grey boxes below the graph.
6) Below the diagram, is a data table showing the same data in tabular form. Click on Tabular data to expand the tab and view the data in tabular form.
7) To compare the data sets of InN and GaN (or any other material), simply type "***GaN***" in the Compare substance search box above the diagram. Adding GaN to the system will automatically populate the associated theoretical and experimental data to the graph and Tabulated data section. *Note, there is a limit to three material comparisons per graph as too much data will, at times, make the graph unreadable.

8) To correctly cite this document, scroll down to the bottom of the page and click the '***Download this citation***' button. This will copy the citation using common data formats like .BIB, .RIS or .EndNote.

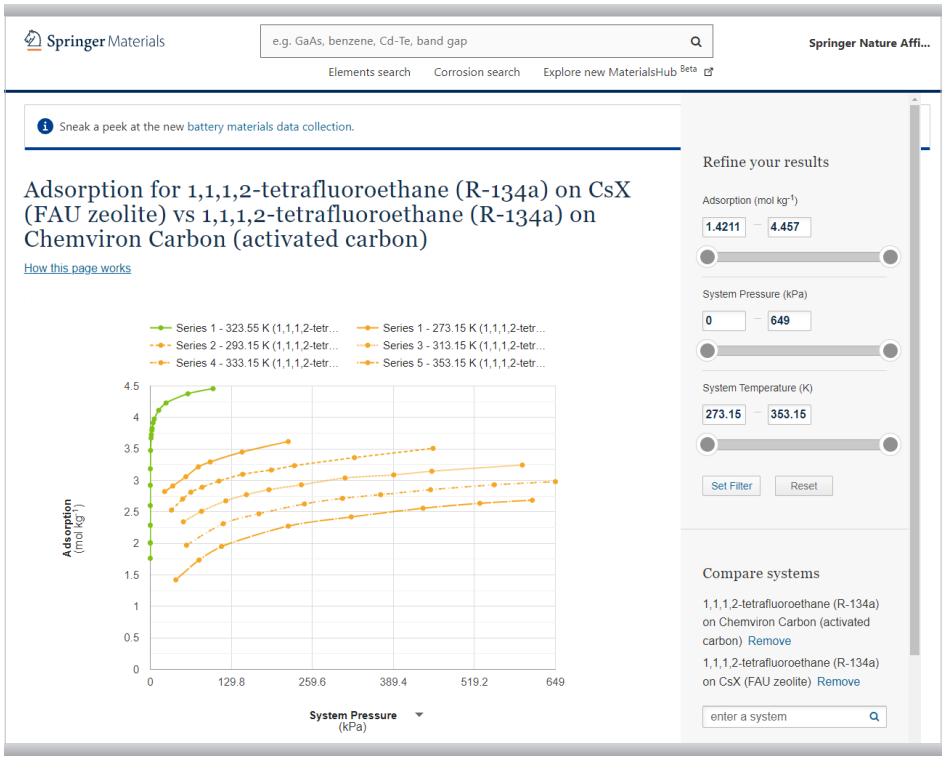
How to find & compare adsorption isotherms using

Example: Find the adsorption isotherm for 1,1,1,2-tetrafluoroethane (R-134a) on CsX (FAU zeolite) (=material #1) and compare with the adsorption isotherm of 1,1,1, 2-tetrafluoroethane (R-134a) on Chemviron Carbon (activated carbon) (= material #2)

1) Go to materials.springer.com
2) Enter "***Tetrafluoroethane***" in the search box. This will generate a list covering Tetrafluoroethane, no matter which property you are looking for, at the time of writing 51 results.
3) To refine these results, select "***adsorption***" from the Properties list on the left-hand side. To do this, you can scroll through the list or type "***adsorption***" under the Properties box. This will produce a single result.
4) Click to open to see an overview of the available content with a brief description of the data range.
5) Select the second result from the table. Click ***View*** to access the data for CsX (FAU zeolite) Adsorbent, this opens an image that shows the adsorption isotherm of 1,1,1,2-tetrafluoroethane on CsX.



6) The final graph shows both sets of isotherms. Clicking on any one of the data points in the diagram opens a pop-up window providing the exact numbers for this given data point.
7) Below the diagram, is a data table showing the same data in tabular form.
8) For each data point in the table, the original reference is provided. Clicking on the Reference and Compilation names provides details.
9) The panel on the right-hand side of the interactive graph allows for manipulation of data. Refining adsorption, system pressure and/or temperature automatically adjusts the graphical representation of data as well as the data table.

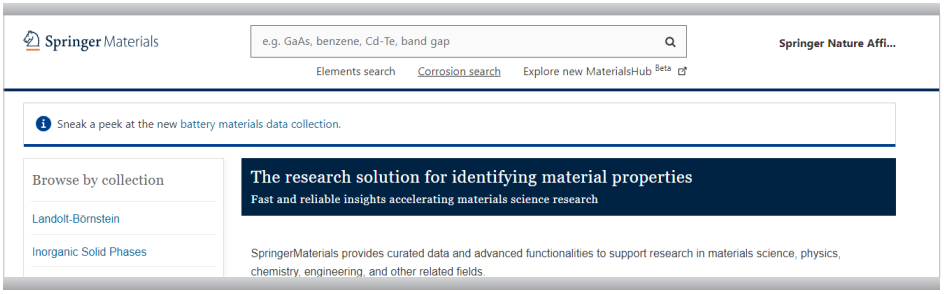


10) To correctly cite this document, scroll down to the bottom of the page and click the '***Download this citation***' button. This will copy the citation using common data formats like .BIB, .RIS or .EndNote.

How to run a basic corrosion search

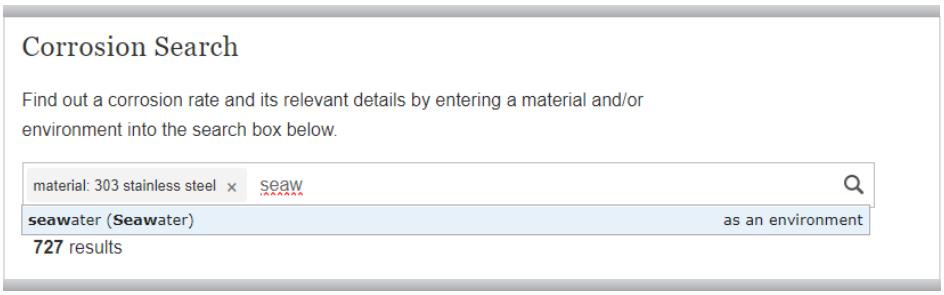
Example: to the beginning of the sentence. Find the Corrosion Rate/Rating of 303 Stainless Steel (= material) in Seawater (= property)

1) Go to materials.springer.com

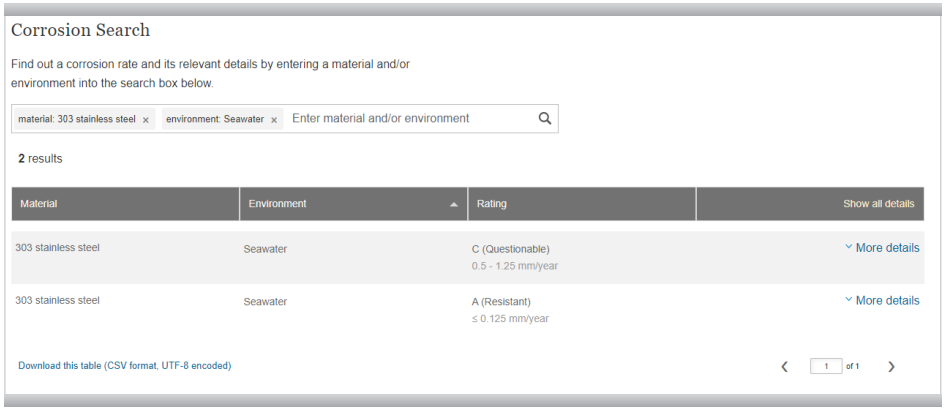


2) Select '***Corrosion search***' at the top of the page.

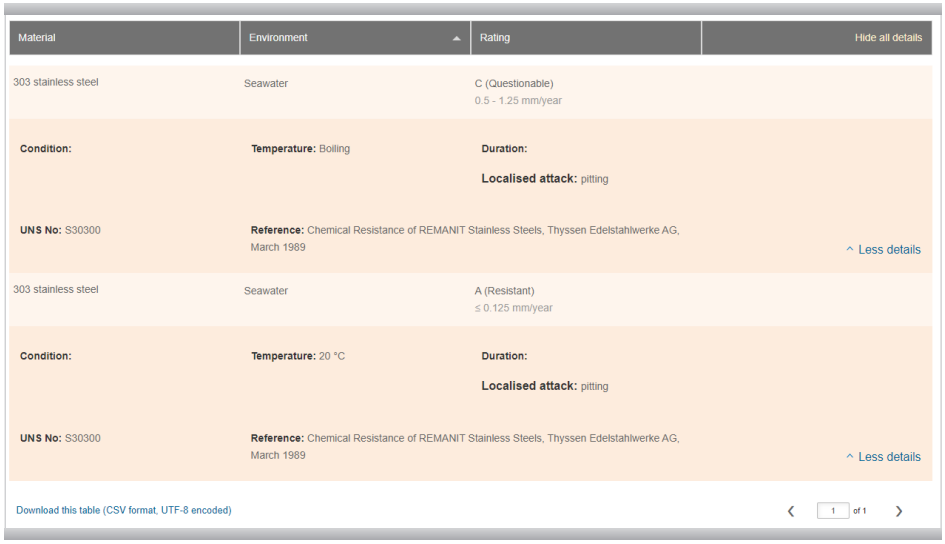
3) Type in "***303 Stainless steel***" for material and "***Seawater***" for environment and hit enter. Note: as you start typing your search the material and environments will appear below and can be chosen to add to the search.



4) This generates a list of all corrosion data available for this material and environment under various conditions.



5) Click on "***More details***" for more details about experimental conditions



Questions

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If you have questions related to product performance, please reach out to the SpringerMaterials product team:

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