

# SpringerMaterials User Guide

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- [Advanced Search](#)
  - [Bibliography](#)
  - [Bookshelf Navigation](#)
  - [Breadcrumb Trail](#)
  - [Contents](#)
  - [Context](#)
  - [Feedback](#)
  - [Full-text Documents](#)
  - [Help](#)
  - [InfoPage](#)
  - [Landolt-Börnstein New Book Series](#)
  - [Metadata](#)
  - [Navigation](#)
  - [Periodic Table Search](#)
  - [REACH](#)
  - [Ranking](#)
  - [Refine](#)
  - [Search](#)
  - [Search Hit](#)
  - [Simple Search](#)
  - [Speed Typing](#)
  - [Subject Area Navigation](#)
  - [Your Query](#)
- 

## Advanced Search

Allows specified searches for Substances/Element Systems, Properties, Molecular Formula, CAS Registry Numbers in the relevant fields. Typing effort for query formulation is reduced by suggestions of terms ([Speed Typing](#)) showing available content.

Substances/Element Systems field: The speed-typing list also offers CAS Registry Number and Molecular Formula next to Substance Name in brackets. Element Systems need to be typed with dashes between the individual elements.

The Molecular Formulas field is case sensitive; please use capital letters where appropriate.

[Your Query](#) combines all simple search strings typed in any of the other fields of the Advanced Search page into a Boolean query that you can either submit as is or adapt to your needs before submitting to the search engine.

The screenshot displays the SpringerMaterials search interface. At the top, there is a search bar with a 'Go' button and an 'Advanced Search' link. Below this, the 'Bibliography' tab is selected, with 'Substances' and 'Help'/'Close' buttons also visible. The main search area is titled 'Your Query' and contains a large text input field with a 'Go' button and a 'Refine' checkbox. Underneath, the 'Search for...' section is divided into four input fields: 'Substances/Element Systems', 'Properties', 'Molecular Formulas', and 'CAS Registry Numbers'. The 'Search in...' section on the left lists various material categories with checkboxes, including 'Particles, Nuclei and Atoms', 'Molecules and Radicals', 'Electronic Structure and Transport', 'Magnetism', 'Semiconductivity', 'Superconductivity', 'Crystallography', 'Thermodynamics', 'Multiphase Systems', 'Advanced Materials', 'Advanced Technologies', and 'Astro- and Geophysics'. To the right of this list, the 'Search for...' section offers three search modes: '...all of these words', '...one or more of these words', and '...exactly this phrase', each with a corresponding text input field. A fourth option, '...but none of these words', is also present but lacks an input field.

## Bibliography

SpringerMaterials contains over 1 million references to primary literature (over 8000 journals referenced).

A full-text search performed on the reference collection will immediately deliver authors, editors, publications if referenced in the database.

Typing effort for query formulation is reduced by suggestions of terms ([Speed Typing](#)) showing available content.

A click on one of the references leads to documents citing this literature.

Substances Bibliography Help Close Feedback

Search for...

Bibliographic References

Smith

Go

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< previous next >

## Bookshelf Navigation

Mirrors the organization of the [Landolt-Börnstein New Book Series](#) in Groups (I to VIII), Volumes and Sub-volumes as on a bookshelf in the library. Click on one of the Groups to move to the content level, a list of available volumes will open in the main window. A click on the volume will show the Table of Contents as in the printed Landolt-Börnstein Volume. A pdf icon (  ) shows that you have reached the content level; the adjacent "i"-icon (  ) opens an [InfoPage](#).

SpringerMaterials The Landolt-Börnstein Database 

Go Advanced Search

Subject Areas Bookshelf Periodic Table Feedback

Group I: Elementary Particles, Nuclei and Atoms	> Group IV: Physical Chemistry
Group II: Molecules and Radicals	<b>Group IV: Physical Chemistry</b>
Group III: Condensed Matter	<b>IV/1a</b> Mechanical Properties · Densities of Liquid Systems · Nonaqueous Systems and Ternary Aqueous Systems
Group IV: Physical Chemistry	<b>IV/1b</b> Mechanical Properties · Densities of Liquid Systems · Densities of Binary Aqueous Systems and Heat Capacities of Liquid Systems
Group V: Geophysics	<b>IV/2</b> Thermodynamic Properties · Heats of Mixing and Solution
Group VI: Astronomy and Astrophysics	<b>IV/3</b> Thermodynamic Properties · Thermodynamic Equilibria of Boiling Mixtures
Group VII: Biophysics	<b>IV/4</b> Thermodynamic Properties · High-Pressure Properties of Matter
Group VIII: Advanced Materials and Technologies	<b>IV/5a</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Ac-Au - Au-Zr
	<b>IV/5b</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · B-Ba - C-Zr
	<b>IV/5c</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Ca-Cd - Co-Zr
	<b>IV/5d</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Cr-Cs - Cu-Zr
	<b>IV/5e</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Dy-Er - Fr-Mo
	<b>IV/5f</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Ga-Gd - Hf-Zr
	<b>IV/5g</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Hg-Ho - La-Zr
	<b>IV/5h</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Li-Mg - Nd-Zr
	<b>IV/5i</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Ni-Np - Pt-Zr
	<b>IV/5j</b> Thermodynamic Properties · Phase Equilibria, Crystallographic and Thermodynamic Data of Binary Alloys · Pu-Re - Zn-Zr
	<b>IV/6</b> Electrical Properties · Static Dielectric Constants of Pure Liquids and Binary Liquid Mixtures
	<b>IV/7a</b> Thermodynamic Properties · Liquid Crystals · Transition Temperatures and Related Properties of One-Ring Systems and Two-Ring Systems without Bridging Groups
	<b>IV/7b</b> Thermodynamic Properties · Liquid Crystals · Transition Temperatures and Related Properties of Two-Ring Systems with Bridging Group

## Breadcrumb Trail

Appears horizontally at the top of a [Search Hit](#), is dynamic and provides a trail for the user to follow back to the starting or entry point. It is a click-able navigation and provides links back to each parent level of the current one. ">" serves as a hierarchy separator.

Typical Breadcrumb Trail:

> [Thermodynamics](#) > [Organic Compounds](#) > [Vapor Pressure and Antoine Constants](#)

## Contents

The world's largest resource for critically evaluated physical & chemical data; comprises the contents of the Landolt-Börnstein New Book Series (> 400 volumes) plus its electronic supplementary material and [REACH](#) Data.

## Context

Appears horizontally below a [Search Hit](#) and displays the surrounding in which the searched string occurs. Indicated bold is whether the searched string (in red) is found in [Metadata](#) or full-text.

Typical Context:

**Metadata - Property:** Antoine constant... **Metadata - Keyword:** Vapor Pressure and Antoine Constants for Nitrogen Containing... **Fulltext:** critical density. Critical constants are significant not only... of recommended critical constants is being published as a... the sample is contained in a constant temperature environment... in a thermostat kept at constant temperature until phase...

## Feedback

A click on the Feedback button activates your email program. Some brief information on your name, profession, affiliation and address is required for us to answer your query more quickly. "Referral" gives us information on your last search.


## Full-text Document

Results shown as display-optimized PDF. [REACH](#) Data and [InfoPage](#) are offered in HTML.

## Help

Help in the [Advanced Search](#) explains the syntax of the Boolean search operators.

## InfoPage

Marked with an "i"-icon (  ) in the list of documents. Provides bibliographic information: "How to cite the document", DOI, title, editor, author, publication date, and references. Also contained is a link-out into its location in the Bookshelf.

Subject Areas	Bookshelf	Periodic Table	Feedback
<ul style="list-style-type: none"> <li>Particles, Nuclei and Atoms</li> <li>Molecules and Radicals</li> <li>Electronic Structure and Transport</li> <li>Magnetism</li> <li>Semiconductivity</li> <li>Superconductivity</li> <li>Crystallography</li> <li>Thermodynamics</li> <li>Multiphase Systems</li> <li>Advanced Materials</li> <li>Advanced Technologies</li> <li>Astro- and Geophysics</li> </ul>	<p>&gt; Electronic Structure and Transport &gt; Refractive Indices</p> <p><b>Pure Liquids and Binary Liquid Mixtures (Supplement to III/38)</b></p> <ul style="list-style-type: none"> <li>1 Introduction</li> <li>Index of Substances</li> <li>Refractive index of carbon disulfide</li> <li>Refractive index of water</li> <li>Refractive index of diphosphine</li> <li>Refractive index of O-methyl phosphorodichloridothioate</li> <li>Refractive index of O-ethyl phosphorodichloridothioate</li> <li>Refractive index of dimethylphosphoramidothioic dichloride</li> <li>Refractive index of isopropylphosphonothioic dichloride</li> <li>Refractive index of diethylphosphoramidothioic dichloride</li> <li>Refractive index of O-phenyl phosphorodichloridothioate</li> <li>Refractive index of phenylphosphonous dichloride</li> <li>Refractive index of tris(2-azidoethyl) phosphate</li> <li>Refractive index of tributyl phosphate</li> <li>Refractive index of tetrachloromethane</li> <li>Refractive index of methanol-d4</li> <li>Refractive index of tribromomethane</li> </ul>		

## Landolt-Börnstein New Book Series

The latest edition of this brand and the first one to be published in the English language. Started as an open series in 1961, it comprises to date > 400 volumes. To see how it is organized click Bookshelf.

### Metadata

SpringerMaterials provides the following metadata extracted in an editorial process: Substance, Element System, CAS Registry Number, Properties, Keywords, Main Subject, Secondary Subjects, and Bibliographic Information.

### Navigation

SpringerMaterials offers two different views of the same content: By [Subject Areas](#) and, for aficionados of the Landolt-Börnstein New Book Series, the [Bookshelf Navigation](#).

### Periodic Table Search

Supports a search by element systems of substances and materials.

You can select elements by clicking on the symbols of the Periodic Table. Chosen elements are highlighted by an orange frame and also displayed in the central Your Selection string.

You can deselect elements by clicking on them a second time either in the Periodic Table or in the Your Selection string.

Chosen elements are highlighted by an orange frame; elements not available for further combinations are grayed-out in the Periodic Table.

Speed-typing: A list of available element systems opens. Chosen elements are marked red, black elements show further possible combinations.

Click on a possible combination from the list, available documents are shown.

To add any other search criteria, click [Refine](#).

Go [Advanced Search](#)

Subject Areas | Bookshelf | **Periodic Table** | Feedback

Al-Fe

Al-B-Fe

Al-Ba-Fe

Al-Be-Fe

Al-C-Fe

Al-Ca-Fe

Al-Ce-Fe

Al-Co-Fe

Al-Cr-Fe

Al-Cu-Fe

Al-Dy-Fe

Al-Er-Fe

Al-Eu-Fe

Al-F-Fe

Al-Fe-Gd

Al-Fe-Ge

Al-Fe-H

Al-Fe-Hf

Al-Fe-Ho

Al-Fe-La

Al-Fe-Li

Al-Fe-Lu

Al-Fe-Mg

Al-Fe-Mn

Al-Fe-Mo

Al-Fe-N

Al-Fe-Nb

Al-Fe-Nd

Select elements by clicking on the symbols.  
Deselect element(s) by clicking a second time.

**Your Selection:**  
Al-Fe\*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IA	IIA	IIIB	IVB	VB	VIB	VIIA	VIIIB	VIIIB	VIIIB	IB	IIB	IIIA	IIIA	IVA	VA	VIA	VIIA
1 H	2 D	3 T															18 He K
4 Li	5 Be											6 B	7 C	8 N	9 O	10 F	11 Ne L
12 Na	13 Mg											14 Al	15 Si	16 P	17 S	18 Cl	19 Ar M
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr N
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe O
55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn P
7 Fr	8 Ra	**	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg							118 Q
			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
			** Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

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## Ranking

The ranking of the displayed documents is performed according to a scoring algorithm. Relevance is calculated by location and frequency of, and conformity with the search term within the document. A hit in the [Metadata](#) is scored higher than one occurring in the full-text. Exact matches are preferred over substring matches.

## REACH

Part of the [Advanced Search](#). It enables finding REACH-relevant (Registration, Evaluation, Authorization and Restriction of Chemicals) information on the substances (alternatively CAS-Registry Numbers, Molecular Formula) included in SpringerMaterials. Also described, where applicable, are the GHS (Classification of Hazardous Substances), RoHS (Restriction of Hazardous Substances), and WEEE (Waste from Electrical and Electronic Equipment).

## Refine

To select or deselect subject areas, or to add any other search criteria, click Refine. You will be automatically directed to the [Advanced Search](#), where you can narrow down your results with more specialized queries; then click Go.

## Search

SpringerMaterials offers [Simple Search](#), the [Periodic Table Search](#) and the [Advanced Search](#).

A query is always case insensitive and substring matching. E.g., "crystal" produces the same results as "Crystal" or "CRYSTAL" and also return hits in "crystalline", "nanocrystalline", etc.

Typing effort for query formulation is reduced by suggestions of terms ([Speed Typing](#)) showing available content.

You can either type your query, then click Go or select a term from the speed-typing list and click Go.

## Search Hit

Each Search Hit shows the following three lines from top to bottom: [Breadcrumb Trail](#), [Full-text Document](#), [Context](#).

Typical Search Hit (search for "ammonia molecular constants"):

The screenshot shows a search result interface. At the top, there is a pagination bar with '1 2 3 4 5 6 next' and 'Results 1 - 10 of 55 Documents'. To the right are 'Clear' and 'Refine' buttons. Below this is a breadcrumb trail: 'Molecules and Radicals > Molecular Constants > Diamagnetic Molecules > Rotational Constants of Diatomic, Linear and Symmetric Top Molecules'. The main title is 'Symmetric top molecules (Update)' with a small icon. The 'Metadata - Substance' field lists 'ammonia...', 'Ammoniak...', 'Ammonia-14N...', and 'Ammonia gas...'. The 'Metadata - Keyword' field lists 'molecular beam spectroscopy...'. The 'Fulltext' field contains a detailed description: 'top molecules Rotational constants, centrifugal distortion constants, rotation-vibration... interaction constants, lambda-type doubling constants,... information concerning the molecular structure, the rotational... distance force constant intermolecular stretching force constant...'

## Simple Search

The Simple Search field is found in the center of the SpringerMaterials homepage and replicated as such in a field below the SpringerMaterials logo. This field will always display the latest query independently of further steps taken.

Typing effort for query formulation is reduced by suggestions of terms ([Speed Typing](#)) showing available content.

You can either type your query, then click Go or select a term from the speed-typing list and click Go.

To add any other search criterion, click [Refine](#).

[Subject Areas](#) | 
 [Bookshelf](#) | 
 [Periodic Table](#) | 
 [Feedback](#)

- Particles, Nuclei and Atoms
- Molecules and Radicals
- Electronic Structure and Transport
- Magnetism
- Semiconductivity
- Superconductivity
- Crystallography
- Thermodynamics
- Multiphase Systems
- Advanced Materials
- Advanced Technologies
- Astro- and Geophysics

Search in

# SpringerMaterials

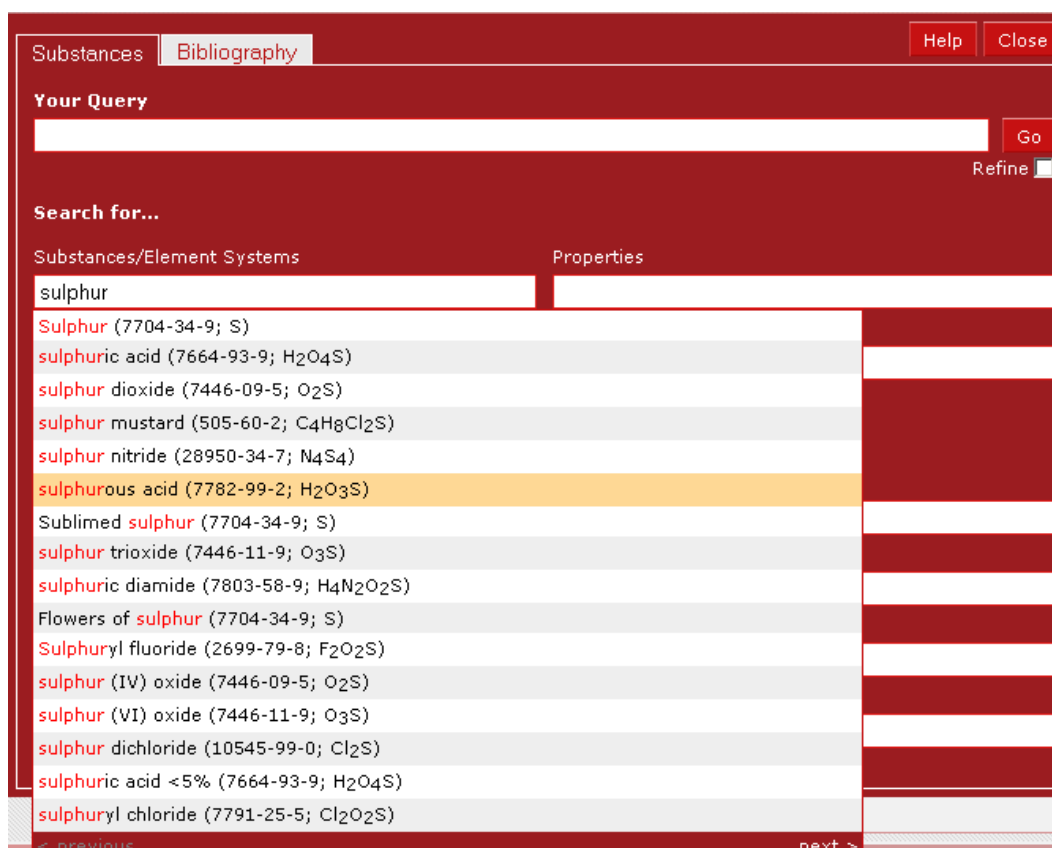
- nuclear magnetic moment
- nuclear magnetic resonance
- nuclear magnetic resonance data
- nuclear magnetic relaxation rate
- nuclear magnetic resonance (NMR)**
- nuclear magnetic resonance method
- nuclear magnetic resonance signal
- 11B nuclear magnetic resonance data
- 15N nuclear magnetic resonance data
- 19F nuclear magnetic resonance data
- 31P nuclear magnetic resonance data
- nuclear magnetic resonance spectrum
- 1H nuclear magnetic resonance spectrum
- Nuclear magnetic resonance experiments
- 13C nuclear magnetic resonance spectrum
- 27Al nuclear magnetic resonance spectrum

Impressum | Contact |

## Speed Typing

Reduces typing effort for query formulation by suggesting terms and showing available content upfront. The more you type, the shorter the list of suggestions gets.







## Subject Area Navigation

SpringerMaterials content is organized in 12 Subject Areas (see homepage):

- Particles, Nuclei and Atoms
- Molecules and Radicals
- Electronic Structure and Transport
- Magnetism
- Semiconductivity
- Superconductivity
- Crystallography
- Thermodynamics
- Multiphase Systems
- Advanced Materials
- Advanced Technologies
- Astro- and Geophysics

Click on one of the Subject Areas to move to the content level, a list of Sub-Areas will open in the main window. Red headlines offer further Sub-Sub-Areas. A "pdf" icon (  ) shows that you have reached the content level; the nearby "i"-icon (  ) opens the [InfoPage](#).

Search:

Subject Areas | Bookshelf | Periodic Table | Feedback

Particles, Nuclei and Atoms	> Magnetism
Molecules and Radicals	<b>Magnetism</b>
Electronic Structure and Transport	Diamagnetic Susceptibilities
Magnetism	Organic Compounds, Oils, Paraffins and Polyethylenes
Semiconductivity	Organic Compounds: Diamagnetism and Magnetic Anisotropy
Superconductivity	Coordination and Organometallic Compounds
Crystallography	<b>Transition Metals</b>
Thermodynamics	Elements, Mutual Alloys and Compounds
Multiphase Systems	Alloys and Compounds with Main Group Elements
Advanced Materials	<b>Rare Earth Metals</b>
Advanced Technologies	Elements, Hydrides and Mutual Alloys
Astro- and Geophysics	Compounds with Transition Metals
	Compounds with Main Group Elements
	Elements, Alloys and Compounds (Update)
	<b>Actinides</b>
	Elements and Compounds
	<b>Oxides</b>
	Fe Oxides, Garnets and Compounds, Lanthanide and Actinide Compounds, Perovskites
	Non-Iron Garnets, Spinels and Hexagonal Ferrites
	Index of substances
	Garnets and Perovskites (Update)
	Fe Oxides and Compounds, Spinels (Update)
	Hexagonal Ferrites, Lanthanide and Actinide Compounds (Update)
	Non-Metals

## Your Query

A field in the [Advanced Search](#) that combines all simple search strings typed in any of the other fields of the Advanced Search page into a Boolean query that you can either submit as is or adapt to your needs before submitting to the search engine.

Go    Advanced Search

Substances    **Bibliography**
Help    Close

**Your Query**

{"urea" or "57-13-6" or "CH4N2O"} "viscosity"
Go

Refine

**Search for...**

Substances/Element Systems	Properties
"urea" or "57-13-6" or "CH4N2O"	"viscosity"
Molecular Formulas	CAS Registry Numbers
<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>

**Search in...**

- Particles, Nuclei and Atoms
- Molecules and Radicals
- Electronic Structure and Transport
- Magnetism
- Semiconductivity
- Superconductivity
- Crystallography
- Thermodynamics
- Multiphase Systems
- Advanced Materials
- Advanced Technologies
- Astro- and Geophysics

**Search for...**

- ...all of these words
- 
- ...one or more of these words
- 
- ...exactly this phrase
- 
- ...but none of these words
-