



SpringerMaterials  
助力您材料科学与工程的研究

巨蓉，施普林格·自然数据库产品经理

**SPRINGER NATURE**

# 提纲：

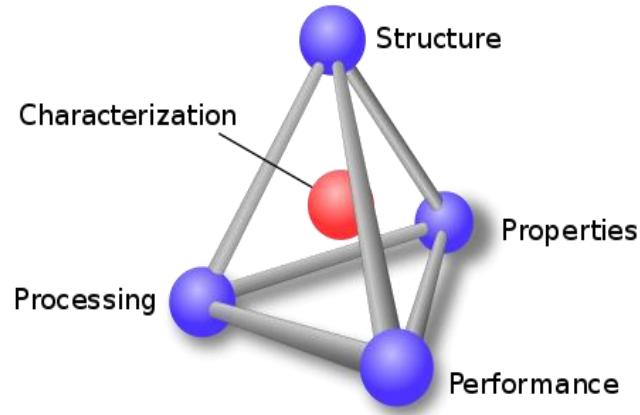
1. 背景介绍
2. SpringerMaterials简介
3. 使用方法
4. 问题解答

# 背景介绍

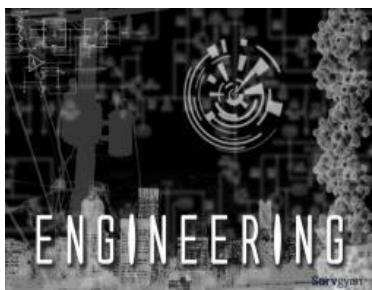
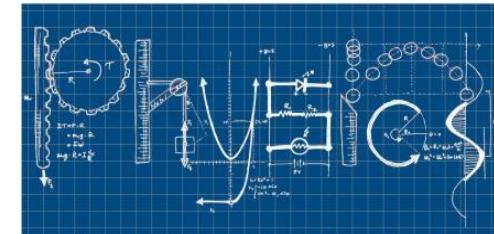
# 什么是材料科学?

- Materials science is the “study of stuff”<sup>1,2</sup>
- Find & use relations between the structure and properties of materials
- Materials science is multidisciplinary:<sup>3</sup>

<b>C</b> Carbon 12.0107	<b>He</b> Helium 4.002602	<b>Mn</b> Manganese 54.938045	<b>I</b> Iodine 126.90447	<b>S</b> Sulfur 32.065	<b>Tm</b> Thulium 168.93421	<b>Rn</b> Radon [222]	<b>Y</b> Yttrium 88.90585
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applied  
manufacturing  
photovoltaics  
numerical  
energy  
Physics  
epitaxy  
solids  
AFM  
growth  
atomic  
modelling  
lasers  
surfaces  
Science  
quantum  
oxides  
optics  
diffraction  
sustainability  
properties  
XRD  
magnetism  
electrons  
microscopy  
magnetism  
spintronics  
catalysis  
nanomaterials  
neutrons  
photons  
Materials  
metals  
films  
photons  
Engineering  
structure  
sensors  
inorganic  
solar  
Chemistry  
organic  
crystals  
polymers  
Biology



- 1) [strangematterexhibit.com/whatis.html](http://strangematterexhibit.com/whatis.html)
- 2) [en.wikipedia.org/wiki/Materials\\_science](https://en.wikipedia.org/wiki/Materials_science)
- 3) [rit.edu/cos/cmse/](http://rit.edu/cos/cmse/)



# 材料种类



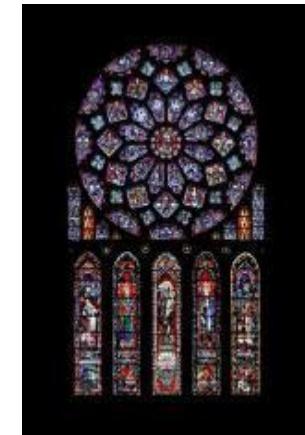
金属



陶瓷



高聚物



玻璃



电子材料



复合材料



外来材料



矿物



生物材料

SPRINGER NATURE

# 材料科学涉及的领域

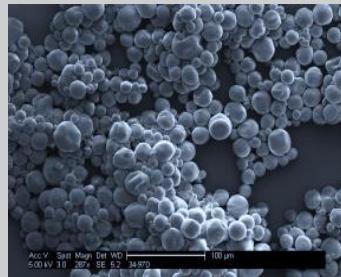
## 半导体和电子学



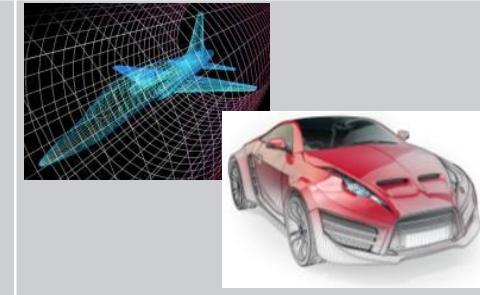
## 化工与制造



## 化学加工与分析



## 汽车航空工程



## 燃料与能源



## 玻璃与陶瓷



## 金属与冶金



## 高分子科学



# SpringerMaterials简介

# SpringerMaterials是什么？

SpringerMaterials : 经筛选整理的**材料性质**数据库

主要材料类型与性质分类包括

金属  
与合金

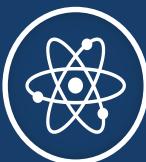
陶瓷  
与玻璃

高分子聚  
合物

有机物

复合材料

原子  
与原子核



物理



化学



热力学



电磁学



结构



机械

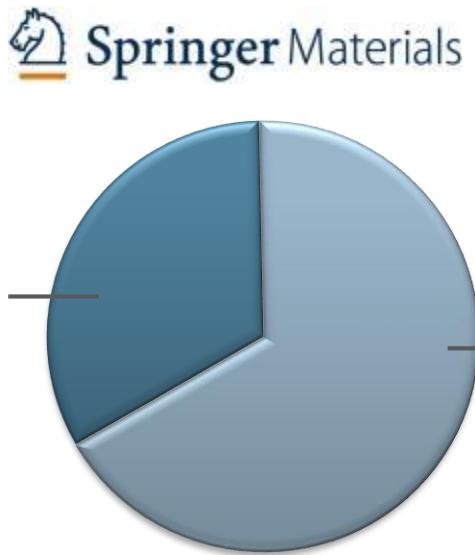


光谱学



原子能

# SpringerMaterials由多个专业子数据库组成



- Linus Pauling Files – Inorganic Solid Phases
- Thermophysical Properties (aka Dortmund Data Bank)
- Adsorption Database
- Polymer Thermodynamics Database (ATHAS)
- NIST Corrosion Database
- MSI Eureka
- Dortmund Databank of Separation Technology
- SpringerMaterials Interactive
- SpringerMaterials Fundamentals Handbooks
- Substance Profiles
- NMR data collection
- Springer Handbooks (e.g., VDI Heat Atlas)



数据库内容按季度持续更新

SPRINGER NATURE

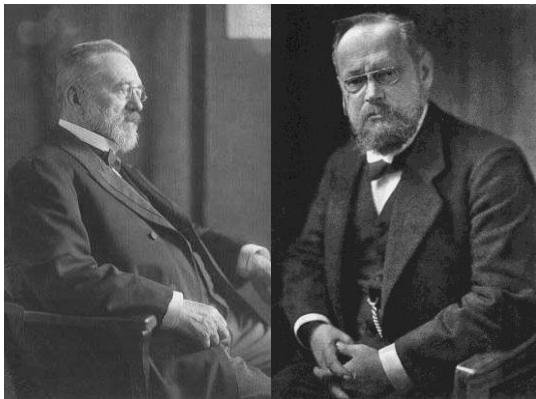
# SpringerMaterials与Landolt-Börnstein: 历史

LANDOLT-  
BÖRNSTEIN

实验结果综述, 最佳实验做法,  
等等

由超过1000名专家、学  
者、编辑评审的数据

柏林  
1883



Hans Landolt

Richard  
Börnstein



The Landolt-Börnstein Series

# Landolt-Börnstein: 威名显赫的用户

ANNALEN

DER

PHYSIK.

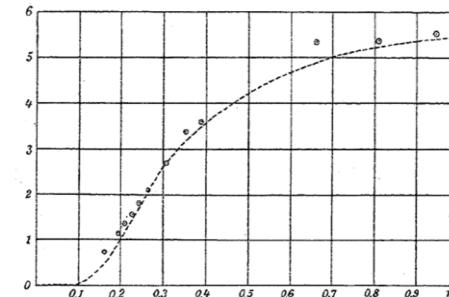
9. Die Plancksche Theorie der Strahlung und  
die Theorie der spezifischen Wärme;  
von A. Einstein.

In zwei früheren Arbeiten<sup>1)</sup> habe ich gezeigt, daß die Interpretation des Energieverteilungsgesetzes der schwarzen Strahlung im Sinne der Boltzmannschen Theorie des zweiten Hauptsatzes uns zu einer neuen Auffassung der Phänomene der Lichtemission und Lichtabsorption führt, die zwar noch keineswegs den Charakter einer vollständigen Theorie besitzt, die aber insofern bemerkenswert ist, als sie das Verständnis einer Reihe von Gesetzmäßigkeiten erleichtert. In der vorliegenden Arbeit soll nun dargetan werden, daß die Theorie der Strahlung — und zwar speziell die Plancksche Theorie — zu einer Modifikation der molekular-kinetischen Theorie der Wärme führt, durch welche einige Schwierigkeiten beseitigt werden, die bisher der Durchführung jener Theorie im Wege standen. Auch wird sich ein gewisser Zusammenhang zwischen dem thermischen und optischen Verhalten fester Körper ergeben.

Bern, November 1906.

(Eingegangen 9. November 1906.)

190 A. Einstein. Plancksche Theorie der Strahlung etc.



betreffenden festen Stoffe vorkommen, für die spezifische Wärme pro Grammäquivalent den Ausdruck<sup>1)</sup>

$$(8a) \quad c = 5,94 \sum \frac{e^{\frac{\beta\nu}{T}} \left(\frac{\beta\nu}{T}\right)^2}{\left(e^{\frac{\beta\nu}{T}} - 1\right)^2}.$$

Wir entnehmen ferner den Tabellen von Landolt und Börnstein einige Angaben über ultrarote Eigenschwingungen (metallische Reflexion, Reststrahlen) einiger durchsichtiger fester Körper; die beobachteten  $\lambda$  sind in nachstehender Tabelle unter „ $\lambda_{\text{beob.}}$ “ angegeben; die Zahlen unter „ $\lambda_{\text{ber.}}$ “ sind obiger Tabelle entnommen, soweit sie sich auf Atome von abnorm kleiner spezifischer Wärme beziehen; für die übrigen soll  $\lambda > 48 \mu$  sein.

Körper	$\lambda_{\text{beob.}}$	$\lambda_{\text{ber.}}$
CaF <sub>2</sub>	24; 31,6	33; > 48
NaCl	51,2	> 48
KCl	61,2	> 48
CaCO <sub>3</sub>	6,7; 11,4; 29,4	12; 21; > 48
SiO <sub>2</sub>	8,5; 9,0; 20,7	20; 21

# 关键材料科学主题涵盖



## 理化数据

- 电子、光学、磁学性质
- 机械性质、反应等

## 材料分析

- 光谱
- 显微成像
- 表征

## 材料结构

- 相图
- 晶体数据

## 热力学

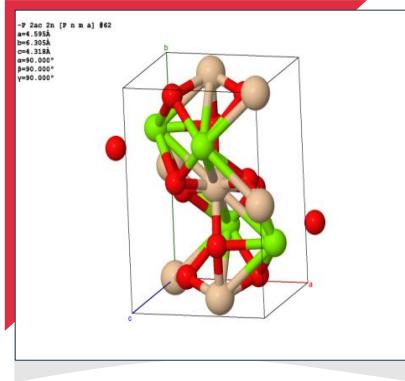
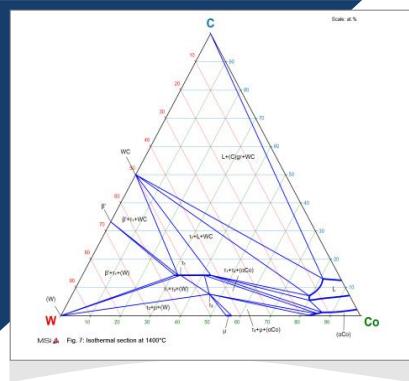
- 相平衡与转换
- 混合物性质

## 表面科学

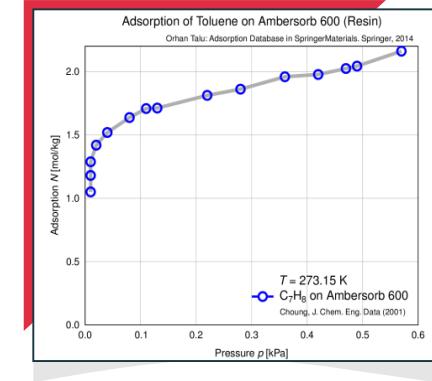
- 气体扩散
- 金属腐蚀
- 扩散

SPRINGER NATURE

**数据类型：相图、晶体结构、数据表格、材料性质档案、曲线图等**



Calculated and Experimental data											
Calculated Data		Experimental Data									
Amorphous + Crystalline		Crystalline									
<b>Filter data by:</b>											
Temperature [K]											
81	600										
Hide Filter Tools											
Temperature T [K]	Amorphous State			Crystalline State							
	Heat Capacity C_p [J/K · mol]	Enthalpy H+Hf(g) [J/mol]	Entropy S [J/K · mol]	Gibbs Energy G [J/mol]	Note						
8 100	0.0000	69321.6400	123.7300	-49399.2700	?	0 0000 0.0000 0					
8 200	0.0000	69321.6400	123.7300	-49264.8000	?	0 0000 0.0000 0					
8 300	0.0000	69321.6400	123.7300	-49224.5200	?	0 0000 0.0000 0					
8 400	0.0000	69321.6400	123.7300	-49272.1500	?	0 0000 0.0000 0					



**Corrosion Search**

Find out a corrosion rate and its relevant details by entering a material and/or environment into the search box below.

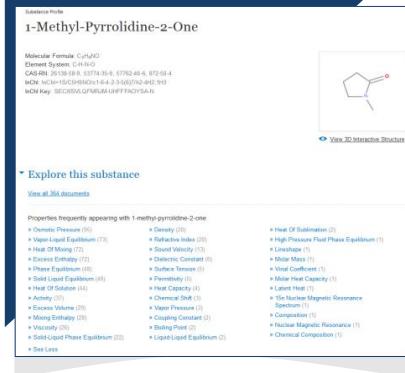
material: Nickel alloy 200 x environment: Sodium Hydroxide x

material: Nickel alloy G x

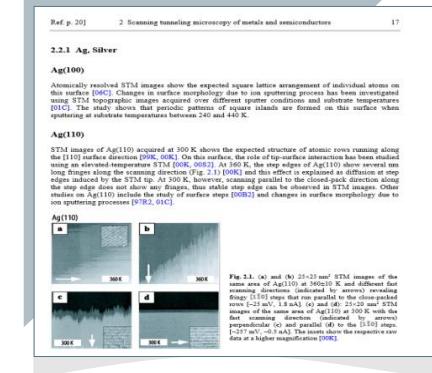
Enter material and/or environment

**86 results**

Material	Environment	Rating	Actions
Nickel alloy 200	Sodium Hydroxide 72 %	A (Resistant) 0.003 mm/year	Show all details
<b>Condition:</b> NaCl concentration unknown	<b>Temperature:</b> 151.0 °C	<b>duration:</b> 29 d <b>Location:</b> attack	
<b>UNS No:</b> M20200	<b>Reference:</b> Corrosion Resistance of Nickel and Nickel-Containing Alloys in Caustic Soda and Other Alkalies, Corrosion Engineering Bulletin CEB-2, The International Nickel Company, Inc., 1973		<b>More details</b>
Nickel alloy 200	Sodium Hydroxide 50 %	A (Resistant) 0.003 mm/year	<b>More details</b>
Nickel alloy 200	Sodium Hydroxide 50-60 %	A (Resistant) 0.01 mm/year	<b>More details</b>



Eu <sub>4</sub> Ga <sub>6</sub> Ge <sub>15</sub> hot charge carrier mobility					
General Information					
Hermann-Maugis Symbol(s) $\langle\overline{1}00\rangle\langle\overline{1}\overline{1}0\rangle$					
Phase Label(s): $\text{Sr}_3(\text{Ga}_6\text{Ge}_5)_2$ II					
Structure Class(es): -					
Property Class(es): ferromagnet, FM, metal, semiconductor					
Material Type: intermetallic					
Pearson Symbol: $\text{P}2\overline{1}2$					
Space Group: 223					
Phase Prototype: $\text{Sr}_3(\text{Ga}_6\text{Ge}_5)_2$					
Compound Class(es): intermetallic					
Physical Properties					
Property	Temperature	Remark	ISP ID	Reference	C��学ographic Database
$\mu_h = 1.7 \cdot 10^{-3} \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$	T = 2 K	from Hall resistivity measurements	P106682	103077. Paschen [201]	SD1025996
$\mu_h = 7 \cdot 10^{-4} \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$	T = 300 K	from Hall resistivity measurements	P106682	103077. Paschen [201]	SD1025996
Cited references:					
103077. Paschen [201]					



## 数据库内容按季度更新

# 核心功能及使用方法

# SpringerMaterials功能概览

**互动** 晶体结构、数据表格、相图、数据输出

按性质和学科领域细化  
检索结果

专有功能及平台强化  
全年不间断部署  
开展

随时随地 可从任何设备  
访问

*materials.springer.com*

**完全访问** Springer  
Materials数据合集所  
有内容

**简单/复杂检索**: 文本、元素  
周期表、化学结构



# SpringerMaterials平台

Springer Materials

Search 

 Search by Elements  Search by Structure  Corrosion Search  Contact us

Browse by collection

Landolt-Börnstein

Adsorption

Inorganic Solid Phases

MSI Eureka

Polymer Thermodynamics

Substance Profile

Thermophysical Properties

Landolt-Börnstein bookshelf

Fast and easy access to curated data on the properties of materials

from the Landolt-Börnstein New Series, the Linus Pauling Files and other integrated resources - find out how it can work for you.

LATEST DEVELOPMENTS ON SPRINGER MATERIALS

 Content Updates in December 2016  
Updates to the Landolt-Börnstein, SpringerMaterials Fundamentals now available. [View more...](#)

materials.springer.com

# 文本框检索和结果细化

- 可以根据数据源、规程和/或单个材料属性对结果进行细化:

The screenshot shows the Springer Materials homepage. At the top left is the Springer Materials logo. Below it is a search bar with a magnifying glass icon and a red circle around it. Underneath the search bar are several navigation links: "Search by Elements", "Search by Structure", "Corrosion Search", and "Contact us". On the left side, there is a sidebar titled "Browse by collection" containing links to "Landolt-Bornstein", "Adsorption", "Inorganic Solid Phases", "MSI Eureka", "Polymer Thermodynamics", "Substance Profile", and "Thermophysical Properties". At the bottom of the sidebar is a link to "Landolt-Bornstein bookshelf". The main content area features a banner with the text "Providing access to numerical and graphical on the properties of materials from the Landolt-Bornstein New Series, the Linus Pauling Files integrated resources - find out how it can work for you." Below the banner are sections for "LATEST DEVELOPMENTS ON SPRINGER MATERIALS", "Citation Exporting", and "Corrosion Database Launched".

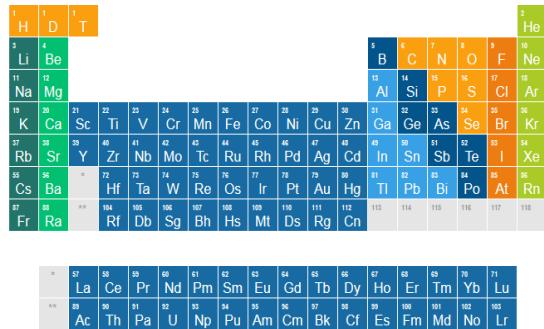
The screenshot shows the search results for "polyethylene" on Springer Materials. At the top right is a "Sign up / Log in" link. Below the search bar are navigation links: "Home", "Search by Elements", "Search by Structure", "Corrosion Search", and "Contact us". The search results are titled "2,972 Result(s) for 'polyethylene'" and include a page navigation bar with "Page 1 of 149". A red box highlights the "Data source" section, which lists "Book Profiles" (5), "Inorganic Solid Phases" (19), "Landolt-Bornstein" (2946), and "Polymer Thermodynamics" (1). Another red box highlights the "Discipline" section, which lists "Advanced Technologies" (4), "Biophysics" (28), "Electromagnetism" (2576), "Geo- And Astrophysics" (2), "Mechanics" (49), "Molecules And Radicals" (19), "Optics" (45), "Particle, Nuclear And Atomic Physics" (1), "Solid-State Physics" (86), and "Thermodynamics" (203). A third red box highlights the "Properties" section, which lists "A-Value" (13), "Absorbed Dose" (1), "Absorption" (1), "Acentric Factor" (9), "Activation Energy" (1), "Adhesion" (2), "Adsorption Energy" (1), "Age" (1), and "Antiferromagnetic Neel Temperature" (1). The results are presented in a grid format with three items per row.

# 周期表检索

- Query: Nb-W

## Search by Elements

Search for information by element system

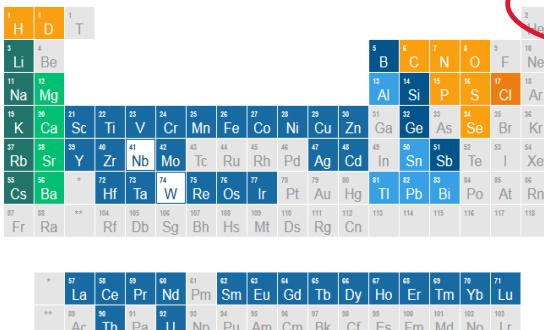


Select elements from the periodic table to search by element system.

Reset

## Search by Elements

Search for information by element system



Your Selection  
Nb-W

173 Matching element systems

Nb-W (33)  
Al-Nb-W (3)  
B-Nb-W (2)  
C-Nb-W (26)  
Co-Nb-W (2)  
Cr-Nb-W (2)  
Cu-Nb-W (4)  
Fe-Nb-W (5)  
H-Nb-W (1)  
Mo-Nb-W (2)  
N-Nb-W (4)  
Nb-Ni-W (11)

Reset

Refine your search

### Data source

<input type="checkbox"/>	Inorganic Solid Phases	16
<input type="checkbox"/>	Landolt-Börnstein	17

### Discipline

<input type="checkbox"/>	Advanced Technologies	6
<input type="checkbox"/>	Biophysics	7
<input type="checkbox"/>	Electromagnetism	9
<input type="checkbox"/>	Mechanics	2
<input type="checkbox"/>	Optics	6
<input type="checkbox"/>	Solid-State Physics	19
<input type="checkbox"/>	Thermodynamics	18

### Properties

<input type="checkbox"/>	Atomic Environment	5
<input type="checkbox"/>	Atomic Position	5
<input type="checkbox"/>	Cell Volume	5
<input type="checkbox"/>	Chemical Diffusion	2
<input type="checkbox"/>	Crystal Structure	7
<input type="checkbox"/>	Crystallographic Data	6
<input type="checkbox"/>	Debye Frequency	1
<input type="checkbox"/>	Density	1
<input type="checkbox"/>	Dielectricity	3

33 Result(s) for 'Nb-W'

Landolt-Börnstein - Group III Condensed Matter

### Additional data to section 1.4.1 Resistivity/atomic percent impurity in dilute alloys

This document is part of Subvolume B 'Electrical Resistivity, Thermoelectrical Power and Optical Properties' of Volume 15 'Metals: Electronic Transport Phenomena' of Landolt-Börnstein - Group III Condensed M...



### Nb-W Binary Phase Diagram 0-100 at.% W

Temperature: 2200...3600 °C (2473...3873 K); Full composition

Investigation: experimental; detailed



### Inorganic Solid Phases

#### Nb<sub>50</sub>W<sub>50</sub> (Nb<sub>0.5</sub>W<sub>0.5</sub>) Crystal Structure

Element system Nb-W; Phase prototype W; Space group: cI2, 229

Data on Cell parameters, Published and standardized atom coordinates



### Inorganic Solid Phases

#### Nb<sub>0.5</sub>W<sub>0.5</sub> Young modulus

Element system: Nb-W; Phase prototype: W; Pearson symbol: cI2, Space group: 229.

Data points: 3; Samples: 1; Journal references: 1.



### Inorganic Solid Phases

#### Nb-W Binary Phase Diagram 0-100 at.% W

Temperature: 2200...3400 °C (2473...3673 K); Full composition

Investigation: experimental; detailed



### Inorganic Solid Phases

#### Nb-W Binary Phase Diagram 0-100 at.% W

Temperature: 2300...3500 °C (2573...3773 K); Full composition

Investigation: experimental; detailed

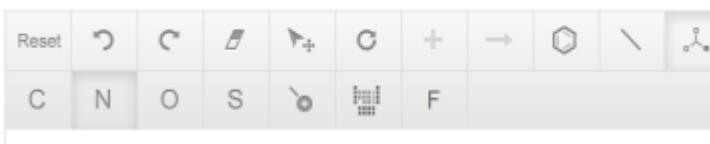


# 化学结构检索

- Query: 苯并噻唑 / 芳硫氮醇 (benzothiazole)

Search by Structure

Start by drawing a structure



Reset C N O S F

C1=CC=C2C=C1S=C2

Benzothiazole

Molecular Formula: C<sub>7</sub>H<sub>5</sub>NS  
Molecular Mass: -  
CAS-No: 12336-28-9, 95-16-9  
InChI: InChI=1S/C7H5NS/c1-2-4-7-6[3-1]8-5-9-7/h1-9H  
InChI Key: IOJUPLGTWVMSFF-UHFFFAOYSA-N  
[View substance profile](#) [Search for this substance](#)

6-Methyl-Benzothiazole

Molecular Formula: C<sub>8</sub>H<sub>7</sub>NS  
Molecular Mass: -  
CAS-No: 2942-15-6  
InChI: InChI=1S/C8H7NS/c1-6-2-3-8[4-6]10-5-9-7/h2-8H, 1H3  
InChI Key: IVKILQAPNDCUNJ-UHFFFAOYSA-N  
[View substance profile](#) [Search for this substance](#)

2-Methyl-Benzothiazole

Molecular Formula: C<sub>8</sub>H<sub>7</sub>NS  
Molecular Mass: -  
CAS-No: 120-75-2  
InChI: InChI=1S/C8H7NS/c1-6-2-7-4-2-3-5-8[4-6]10-6/h2-8H, 1H3  
InChI Key: OXYYSGDWQCSKKO-UHFFFAOYSA-N  
[View substance profile](#) [Search for this substance](#)

Benzothiazol-2-Ylamine

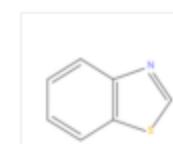
Molecular Formula: C<sub>7</sub>H<sub>6</sub>N<sub>2</sub>S  
Molecular Mass: -  
CAS-No: 120045-46-7, 136-95-8, 35358-53-8  
InChI: InChI=1S/CTHN2S/c8-7-9-5-3-1-2-4-6[5]10-7/h1-4H, (H2,8,9)  
InChI Key: UHGULLIUBCTEF-UHFFFAOYSA-N  
[View substance profile](#) [Search for this substance](#)

2-(Methylamino)Benzothiazole

Molecular Formula: C<sub>8</sub>H<sub>8</sub>N<sub>2</sub>S  
Molecular Mass: -  
CAS-No: 16954-69-1  
InChI: InChI=1S/C8H8N2S/c1-9-8-10-6-4-2-3-5-7[8]11-8/h2-8H, 1H3, 1H9  
InChI Key: QVKPPRYUGJFISN-UHFFFAOYSA-N  
[View substance profile](#) [Search for this substance](#)

Benzothiazole

Molecular Formula: C<sub>7</sub>H<sub>5</sub>NS  
Element System: C-H-N-S  
CAS-RN: 12336-28-9  
InChI: InChI=1S/C7H5NS/c1-2-4-7-6[3-1]8-5-9-7/h1-9H



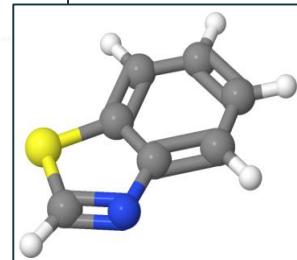
[View 3D Interactive Structure](#)

## Explore this substance

[View all 8 documents](#)

Properties frequently appearing with benzothiazole

- Phase Equilibrium (2)
- Osmotic Pressure (2)
- Vapor-Liquid Equilibrium (2)
- Exaltation Data (1)
- Melting Temperature (1)
- Magnetic Susceptibility Exaltation (1)
- Transition Enthalpy (1)
- Differential Scanning Calorimetry (1)
- See Less
- Phase Transition Temperature (1)
- Phase Transition (1)
- Heat Of Fusion (1)
- Boling Point (1)
- Diamagnetic Susceptibility Exaltation (1)
- Magnetic Susceptibility (1)
- Quadrupole Coupling (1)
- Density (1)
- Diamagnetic Susceptibility (1)
- Nuclear Quadrupole Resonance Spectroscopy (1)
- Vapor Pressure (1)
- Heat Of Sublimation (1)
- Refractive Index (1)
- Heat Of Transition (1)
- Asymmetry Parameter (1)



# 腐蚀数据检索

- 按物料及环境搜寻及分类

Corrosion Search

## Seawater-301 stainless steel / 2Ni steel

Find out a corrosion rate and its relevant details by entering a material and/or environment into the search box below.

environment: Seawater × material: 301 stainless steel × material: 2Ni steel × 

Enter material and/or environment

7 results

Material	Environment	Rating
301 stainless steel	Seawater	A (Resistant) ≤ 0.125 mm/year
2Ni steel	Seawater	A (Resistant) 0.084 mm/year
2Ni steel	Seawater	A (Resistant) 0.1 mm/year
2Ni steel	Seawater	B (Good) 0.19 mm/year
301 stainless steel	Seawater	C (Questionable) 0.5–1.25 mm/year
2Ni steel	Seawater	Localized
2Ni steel	Seawater	Localized

Download this table (CSV format, UTF-8 encoded)

## Corrosion Search

Find out a corrosion rate and its relevant details by entering a material and/or environment into the search box below.

material: Niobium × 

Enter material and/or environment

157 results

## 铌在硫酸 (Niobium in sulfuric acid)

2 of 15

Material	Environment	Rating	▼ Show all details
Niobium	Sulfuric Acid 98 %	A (Resistant) 5.0E-4 mm/year	
Condition:	Temperature: 19.0 °C – 26.0 °C	Duration: 36 d	Localised attack:
UNS No: R04210	Reference: Metals Handbook, Ninth Edition, Vol 13, Corrosion, ASM International, Metals Park, OH, 1987, p 730		▲ Less details
Niobium	Sulfuric Acid 72 %	A (Resistant) 0.1 mm/year	▼ More details
Niobium	Sulfuric Acid 72 %	A (Resistant) 0.03 mm/year	▼ More details
Niobium	Sulfuric Acid 50 %	A (Resistant) ≤ 0.125 mm/year	▼ More details
Niobium	Sulfuric Acid 50 %	A (Resistant) ≤ 0.125 mm/year	▼ More details

# 晶体结构及互动功能

Query: ZrO<sub>2</sub> monoclinic Crystal structure

Inorganic Solid Phases

## ZrO<sub>2</sub> monoclinic (ZrO<sub>2</sub> rt) Crystal Structure

[Download Data](#)

### General Information

Phase Label(s): ZrO<sub>2</sub> rt  
 Structure Class(es): –  
 Classification by Properties: ionic conductor, nonmetal  
 Mineral Name(s): baddeleyite  
 Pearson Symbol: *m*P12  
 Space Group: 14  
 Phase Prototype: ZrO<sub>2</sub>-b  
 Measurement Detail(s): –  
 Phase Class(es): –  
 Compound Class(es): oxide  
 Interpretation Detail(s): complete structure  
 Sample Detail(s): –



[View 3D Interactive Structure](#)

### Experimental Details

### Reference

### 3D Interactive Structure

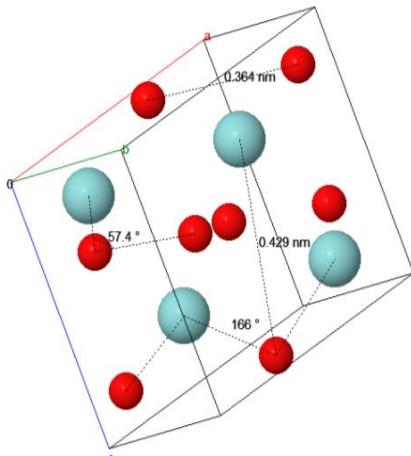
Unit Cell

Multiple Unit Cell

More Options

Export Options

-P 2ybc [P 1 21/c 1] #14  
 a=5.197Å  
 b=5.280Å  
 c=5.350Å  
 α=90.000°  
 β=99.530°  
 γ=90.000°



JSmol

Reference

### 3D Interactive Structure

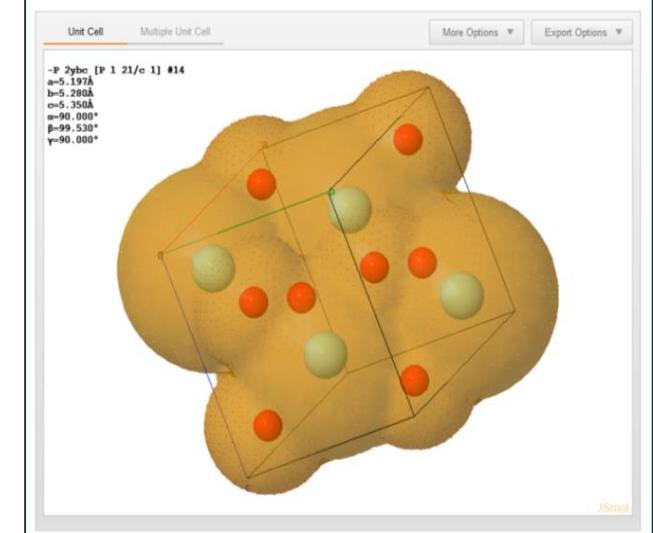
Unit Cell    Multiple Unit Cell    More Options    Export Options

-P 2ybc [P 1 21/c 1] #14  
 a=5.197Å  
 b=5.280Å  
 c=5.350Å  
 α=90.000°  
 β=99.530°  
 γ=90.000°

File  
 model 1/1  
 Configurations  
 Select (R)  
 View  
 Style  
 Color  
 Surfaces  
 Symmetry  
 Scenes  
 Zoom  
 Spin  
 Vibration  
 Spectra  
 Animation  
 Measurements  
 Set probing  
 Console  
 Java/Script Console  
 Show  
 Computation  
 Language  
 About this JSmol

- Show Measurements
- Double-Click begins and ends all measurements
- Click for distance measurement
- Click for angle measurement
- Click for torsion (dihedral) measurement
- Delete measurements
- List measurements
- Distance units nanometers
- Distance units Angstroms
- Distance units picometers

JSmol



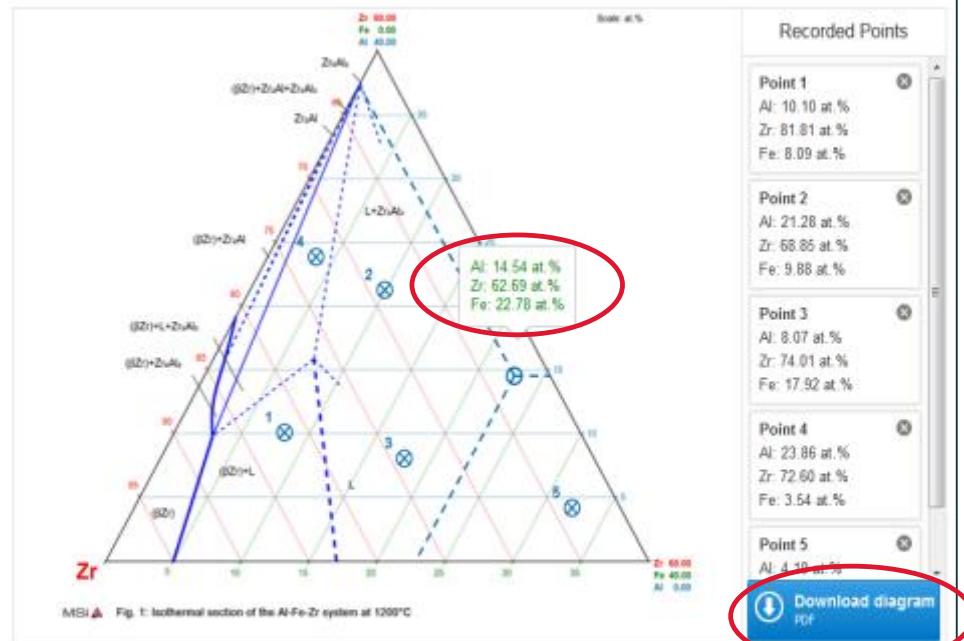
# 相图、数据及互动功能

- Interactive Phase Diagrams: (Al-Fe-Zr):

## Isothermal section of the Al-Fe-Zr system at 1200°C

Figure 1 from evaluation report:

Al-Fe-Zr Ternary Phase Diagram Evaluation



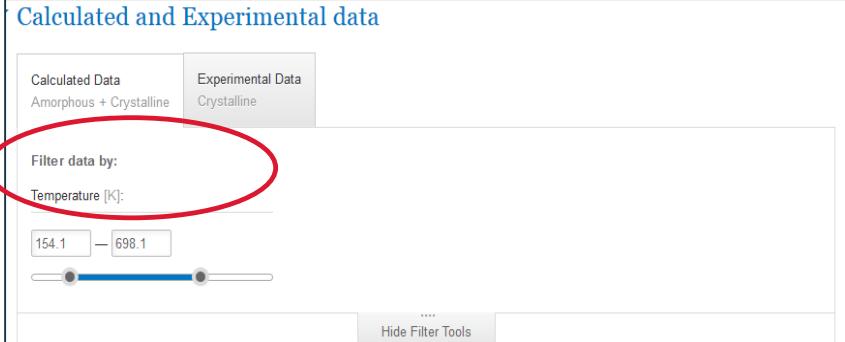
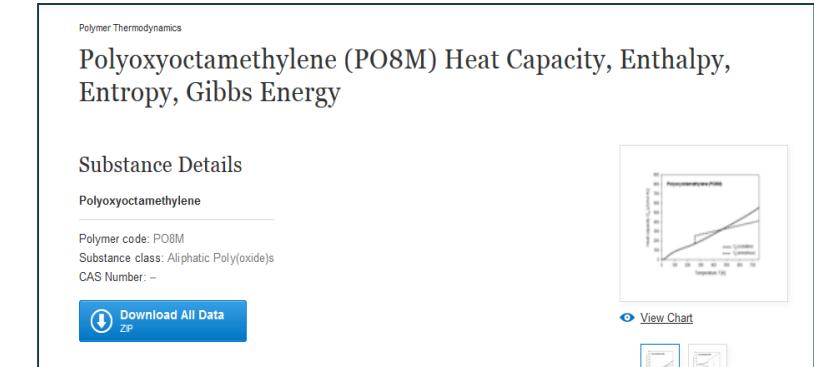
### General Information

Concentration Range: Fe conc. [0-40 at. %] vs. Al conc. [0-40 at. %] vs. Zr conc. [60-100 at. %]

Temperature: 1200 °C

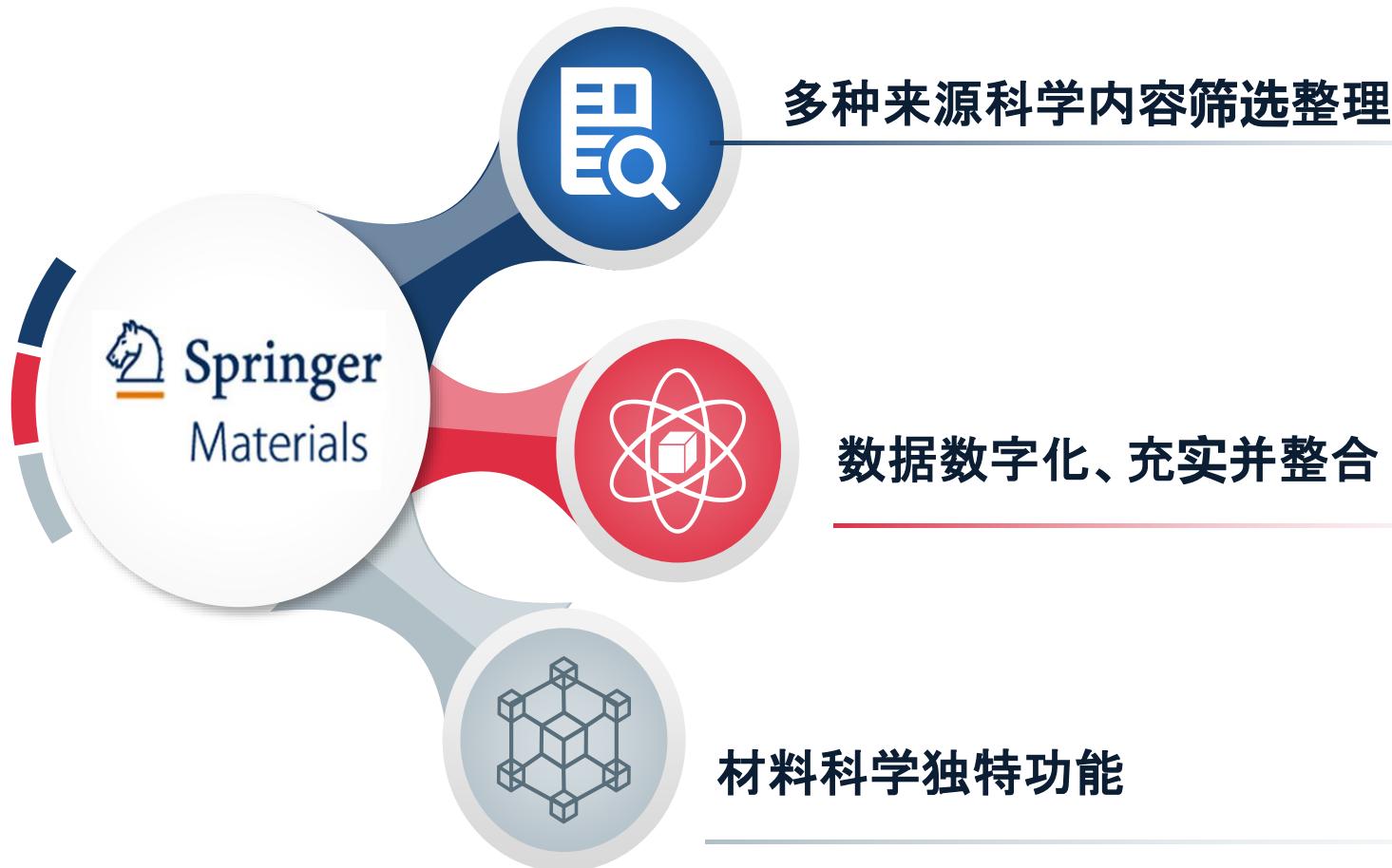
### Reference

- Data Table Sliders:



Temperature $T$ [K]	Amorphous State					Crystalline State		
	Heat Capacity $C_p$ [J/(K·mol)]	Enthalpy $H-H_0[c]$ [J/mol]	Entropy $S$ [J/(K·mol)]	Gibbs Energy $H_0[c]-G$ [J/mol]	Note	Heat Capacity $C_p$ [J/(K·mol)]	Enthalpy $H-H_0[c]$ [J/mol]	Entropy $S$ [J/(K·mol)]
160.000	119.9360	33381.0900	178.3540	-4844.4500	<a href="#">7</a>	119.9360	10291.4300	114.97
170.000	124.8230	34604.5700	185.7630	-3024.8600	<a href="#">7</a>	124.8230	11514.9000	122.38
180.000	129.7390	35877.4600	193.0470	-1129.0000	<a href="#">7</a>	129.7390	12787.7900	129.66
190.000	134.6990	37199.1400	200.1740	833.9200	<a href="#">7</a>	134.6990	14109.4700	136.79
200.000	139.7570	38571.9800	207.2300	2874.0200	<a href="#">7</a>	139.7570	15482.3100	143.84
210.000	144.9390	39995.0500	214.1650	4979.6000	<a href="#">7</a>	144.9390	16905.3800	150.78
220.000	150.2640	41471.0300	221.0400	7157.7700	<a href="#">7</a>	150.2640	18381.3600	157.65

# SpringerMaterials: 打造现代数据库



数据来源: 经典 Landolt-Börnstein 系列、MSI Eureka、Linus Pauling 文档-无机固相、聚合物热力学数据库(ATHAS)、Dortmund 分离技术数据库、施普林格系列手册(例如, VDI Heat Atlas)、吸附数据库、NIST 腐蚀数据库、SpringerMaterials 基础知识手册

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