

Springer Nature 解决方案类产品
功能介绍及技术进展：

Springer Materials 与 Springer
Protocols

ADVANCING
DISCOVERY

内容概括

1	情报分析及科研人员信息搜索过程中常见的问题
2	文献资料搜集及汇总的必要性以及问题解决思路
3	Springer Nature 针对重要学科方向的解决方案
4	问题解答

情报分析及科研人员在信息搜索过程中常见的问题

1.0

最大的痛点：不是缺乏信息而是搜索到的信息太多

The Global STM Research ¹⁻³ Landscape in 2017:

8,000,000 active researchers

2,700,000 patent applications

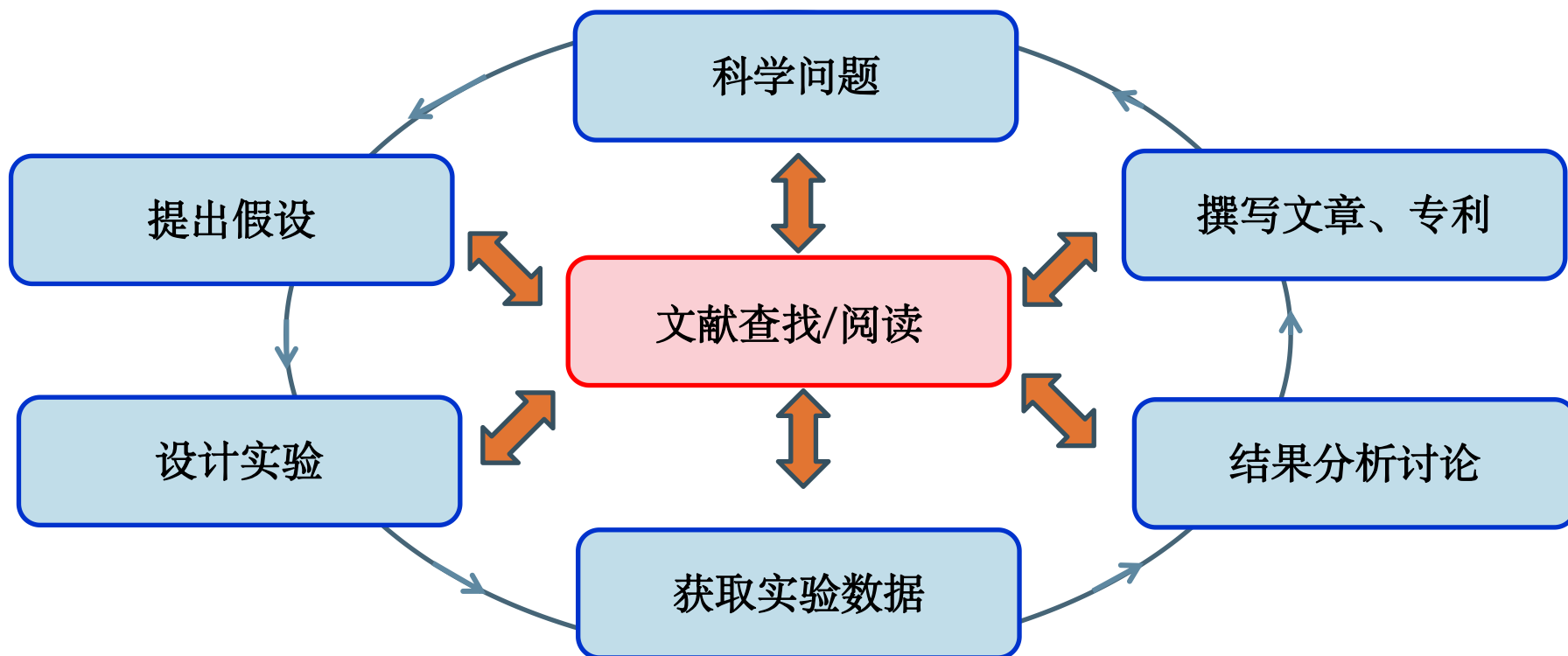
5,500 books released

15,000 peer reviewed journals

1,600,000 journal articles published

2,000 research data repositories⁴

科研工作流程



文献资料信息搜索中常见的问题

大量无关的搜索结果会产生不确定性



验证搜索结果的相关性需要访问原文



应用特定的搜索关键词极易漏掉有用的信息




文献浏览及评估需要大量时间

材料学科相关搜索案例

查询：“聚乙烯的热容”

12,200,000 results



The image shows a Google search interface. The search bar contains the text "heat capacity of polyethylene". Below the search bar, there are tabs for "All", "Images", "Videos", "News", "Shopping", and "More". The "All" tab is selected. Below the tabs, it says "About 12.200.000 results (0,44 seconds)". A red arrow points from the "12,200,000 results" text above to the "About 12.200.000 results" text in the search results. The first search result is a snippet from a NIST page, titled "Heat capacities of polyethylene from 2 to 360 K Standard ... - NIST Page" with the URL "https://nvlpubs.nist.gov/nistpubs/jres/77A/jresv77An4p395_A1b.pdf". Below the snippet, there are links for "About this result" and "Feedback".



As the amount of scientific information exponentially increases, we understand the need to find **relevant, reliable, critically evaluated** data on-demand.

文献资料信息搜索耗费大量的时间

If 1 researcher searches for about 20 minutes per day:

$$\left(20 \frac{\text{min}}{\text{day}} \right) \times \left(250 \frac{\text{work days}}{\text{year}} \right) \times \left(\frac{1 \text{ hour}}{60 \text{ min}} \right) = \boxed{83 \frac{\text{hours}}{\text{year}}}$$

If 8 million researchers search for 20 minutes per day:

$$\left(8,000,000 \text{ researchers} \right) \times \left(83 \frac{\text{hours}}{\text{year}} \right) =$$

$$\boxed{664,000,000 \frac{\text{hours}}{\text{year}} \cdot \text{researcher}}$$

文献资料搜集及汇总的必要性及问题解决思路

2.0

主要的问题



对于时间有限的教授和研究员 需要更多时间从大量目标文献中提取感兴趣话题的研究进展



对于刚入组的新生缺乏专业阅读文献的能力，进而很难快速了解从事课题的研究进展以及相应实验的制备方法



具体数值的获取获取 难以从搜索到的文献中快速提取并获得某种材料物理化学性质的特定值



专业的实验室指南平台 相关领域研究者期望准确提取的实验室指南和方法平台可以帮助重复自己的科学实验

材料学科相关文献资料的收集与汇总

哪个搜索的更好? 举例: “聚乙烯的热容”

7,390,000 results
with pay-walled journal articles and static pdfs
5 minutes

1 result
with a dynamic chart linked directly to primary
research
10 seconds

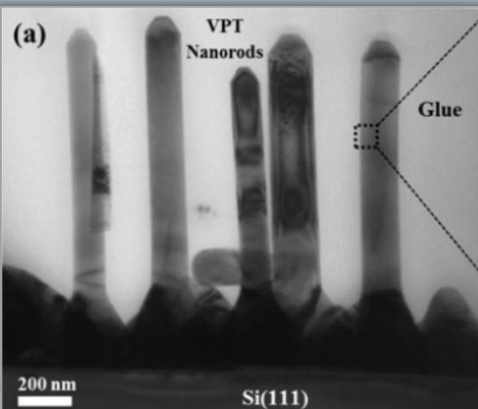
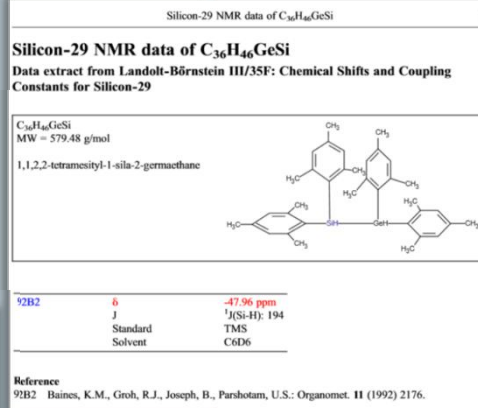
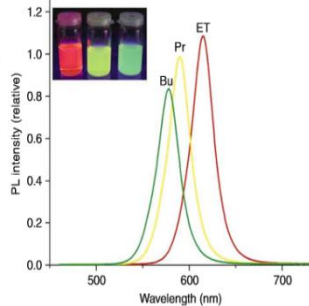
Google search results for "heat capacity of polyethylene". The search bar shows the query. Below the search bar, it says "About 7,390,000 results (0.41 seconds)". The first search result is titled "Heat Capacity of Polyethylene from 2.5° to 30°K" with a URL from aip.scitation.org. Below this, there is a PDF link to NIST data: "[PDF] Heat capacities of polyethylene from 2 to 360 KI Standard ... - NIST ...".

Springer Materials search results for "heat capacity of polyethylene". The search bar shows the query. Below the search bar, it says "1 result(s) using Focused Search for substance: polyethylene; property: heat capacity of". The search results are filtered by "Data source" (Polymer Thermodynamics: 1), "Discipline" (electromagnetism: 1, mechanics: 1, thermodynamics: 1), and "Properties" (enthalpy, entropy, Gibbs energy, glass transition, heat capacity). The main result is titled "Polyethylene (PE) Heat Capacity, Enthalpy, Entropy, Gibbs Energy" and includes a "Temperature Range (0.100 ... 1000.000) K" and a dynamic chart icon.

材料分析及表征中具体数值的提取

Spectroscopy and Microscopy

Fig. 11.9 Luminescence spectra of CdSe/ZnS/silica nanocomposites prepared with different silica precursor: TEOS (red line), TPOS (yellow line), and TBOS (green line). Inset: photograph of final product with different silica precursor TEOS (left), TPOS (middle), and TBOS (right) under UV lamp (From Ref. [66])



Spectroscopic

Data

Large collections of data for all material types (metals, organics, liquids, polymers, etc.)

Key Methods

Covered

UV-Vis, IR, Raman, PES, Mössbauer, etc.

NMR Data

- Multiple Nuclei (1H , ^{13}C , ^{19}F , ^{17}O , ^{77}Se)
- Chemical shifts, coupling constants
- Small molecules, polymers, heterocycles

Microscopy

TEM, SXES, STM, etc.

生命科学领域相关研究人员需要实验室指南和方法


实验室指南可以识别、操纵和解释分子细胞组件的生物学过程、功能、结构和活性。

实验室指南的特点

- 分步说明以执行特定的实验室技术
- 科学程序的标准化工以确保复制
- 包括材料、设备、注意步骤、故障排除、计算的详细列表
- 确保始终以相同的方式重复实验

The Most Amazing Lasagna Recipe

Prep time	Cook Time	Time to Make It
1 hour 30 mins	50 mins	2 hours 20 mins



The Most Amazing Lasagna Recipe is the best recipe for homemade Italian-style lasagna. The balance between layers of cheese, noodles, and homemade bolognese sauce is perfection!


Author: Rachel Farnsworth
Yield: Serves 8


Ingredients

- 1 pound sweet Italian sausage
- 1 pound lean ground beef
- 1 large white onion, minced
- 5 cloves garlic, crushed
- 1 (28 ounce can) crushed tomatoes
- 2 (6 ounce can) tomato paste
- 1 (15 oz can) tomato sauce
- ½ cup chicken broth
- 2 tablespoons white sugar
- ½ cup chopped fresh basil
- 1 teaspoon fennel seeds
- 1 teaspoon ground oregano
- ½ teaspoon salt
- ¼ teaspoon ground black pepper
- ¼ cup + 2 tablespoons chopped fresh parsley (divided)
- 1 pound lasagna noodles
- 30 ounces ricotta cheese
- 1 large egg
- ½ teaspoon salt
- ½ teaspoon ground nutmeg
- 1 pound deli sliced mozzarella cheese
- 1 cup freshly grated Parmesan cheese

Instructions

1. In a *large pot* over medium heat, add in ground sausage and ground beef. Use a spoon to break up the meat into small pieces. Add in onion and garlic and cook until meat is well browned, stirring constantly. Stir in sugar, fresh basil, fennel, oregano, ½ teaspoon salt, pepper, and ¼ cup chopped parsley. Pour in crushed tomatoes, tomato paste, tomato sauce, and chicken broth. Stir well and bring to a simmer. Reduce heat to low and simmer 1-4 hours, stirring occasionally.
2. Meanwhile, place lasagna noodles into the bottom of a *pan*. Pour hot tap water directly over the noodles, making sure the pasta is completely immersed in the water. Let them soak for 30 minutes, then drain and discard water.
3. In a *mixing bowl*, combine ricotta cheese with egg, remaining 2 tablespoons parsley, ½ teaspoon salt, and nutmeg. Refrigerate until ready to assemble lasagna.
4. Preheat oven to 375 degrees. Lightly grease a *deep 9x13 pan*.
5. To assemble, spread about 1 cup of meat sauce in the bottom of the prepared pan. Place 4 noodles on top. Spread with ½ of the ricotta cheese mixture. Top with ¼ of mozzarella cheese slices. Spoon 1½ cups meat sauce over mozzarella, then sprinkle with ¼ cup parmesan cheese. Repeat layering two more times to create three complete layers. To finish, place a final layer of pasta, topped with another 1 cup of meat sauce to cover the pasta. Top with remaining mozzarella and Parmesan cheese. Cover loosely with aluminum foil.
6. Bake in preheated oven for 25 minutes. Remove foil, and bake an additional 25 minutes to allow cheese to brown. Serve hot.





Springer Nature 针对重要学科方向的解决方案

3.0

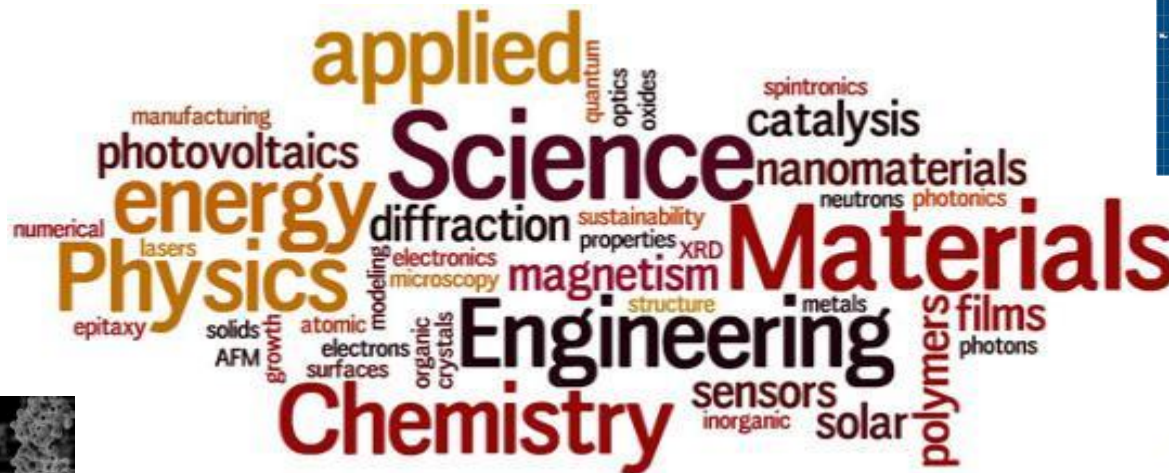
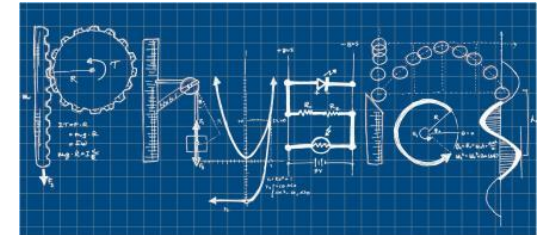
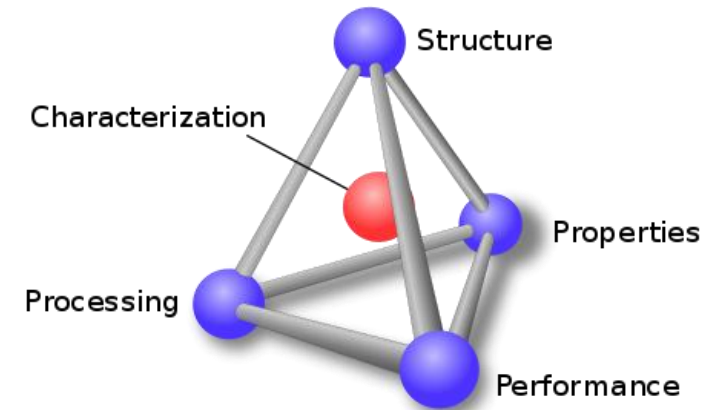
材料科学

3.1

材料科学

- 材料科学是一个研究材料的很大的学科^{1,2}
- 查找并使用材料的结构与特性之间的关系
- 材料科学具有多学科间很强的交叉性³

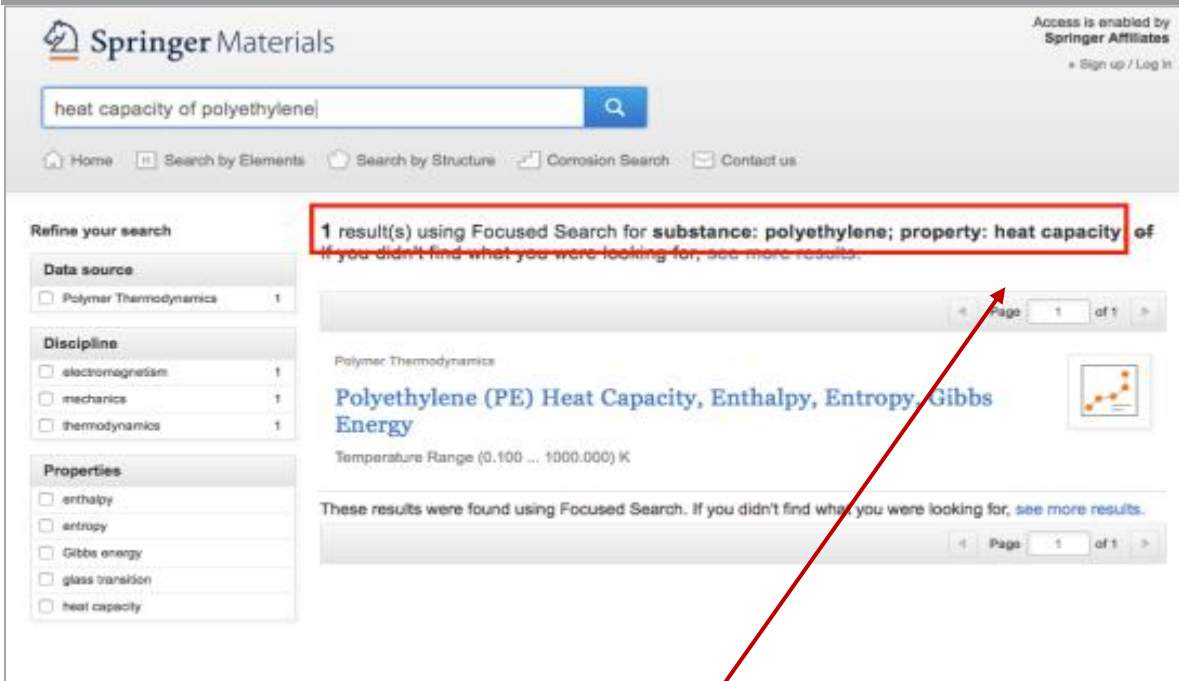
6 C Carbon 12.0107	2 He Helium 4.002602	25 Mn Manganese 54.938045	53 I Iodine 126.90447	16 S Sulfur 32.065	69 Tm Thulium 168.93421	86 Rn Radon [222]	39 Y Yttrium 88.90585
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- 1) strangematterexhibit.com/whatis.html
- 2) en.wikipedia.org/wiki/Materials_science
- 3) rit.edu/cos/cmse/

SPRINGERMATERIALS运用值得信赖的资源为您节省时间

materials.springer.com



1 个结果

直接链接到主要研究成果的可交互使用的图表

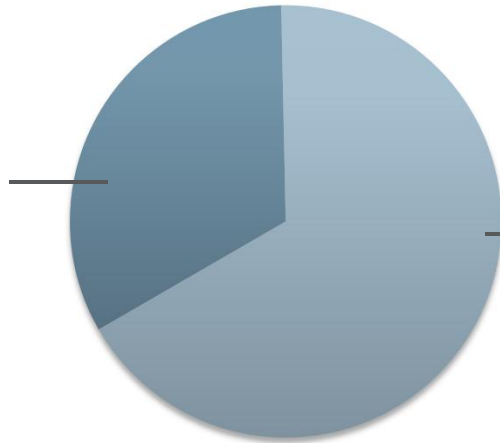


SpringerMaterials

是世界上最大的材料科学数据库之一，可在一个平台上快速提供包含290,000多种材料和3,000个性质的可信赖的精选内容。

借助整合的多源平台：含有多个子数据库

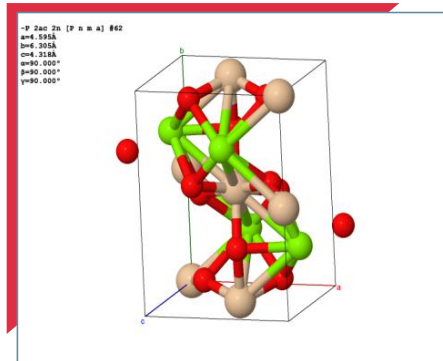
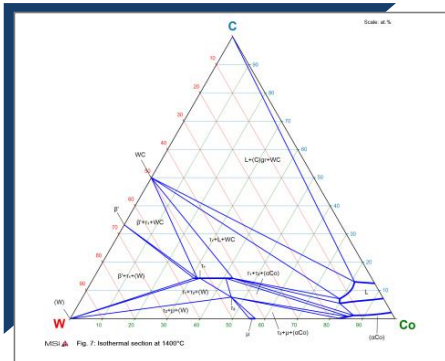
 Springer Materials



- Linus Pauling Files – Inorganic Solid Phases
- Thermophysical Properties (aka Dortmund Data Bank Technology)
- Adsorption Isotherm 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)

SpringerMaterials 内容概览

数据类型: 相图、晶体结构、数据表格、材料性质档案、曲线图等等。



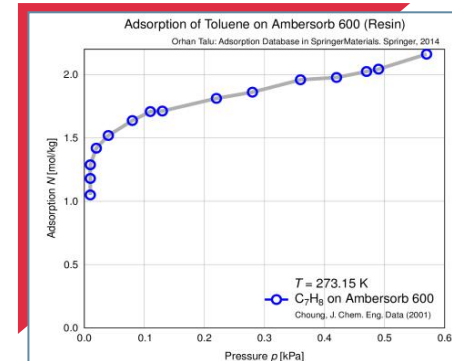
Calculated and Experimental data

Calculated Data: Amorphous + Crystalline

Experiment Data: Crystalline

Filter data by:
Temperature [K]: 0.1 - 600

Temperature T [K]	Amorphous State			Crystalline State				
	Heat Capacity C _p [J/(K mol)]	Enthalpy H-T [J/(mol)]	Entropy S [J/(K mol)]	Gibbs Energy G-T [J/(mol)]	Note	Heat Capacity C _p [J/(K mol)]	Enthalpy H-T [J/(mol)]	Entropy S [J/(K mol)]
0.100	0.0000	69321.6400	123.7300	-69309.2700	?	0.0000	0.0000	0.0000
0.200	0.0000	69321.6400	123.7300	-69296.8900	?	0.0000	0.0000	0.0000
0.300	0.0000	69321.6400	123.7300	-69284.5200	?	0.0000	0.0000	0.0000
0.400	0.0000	69321.6400	123.7300	-69272.1500	?	0.0000	0.0000	0.0000



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 | Environment: Seawater, Sodium Hydroxide

95 results

Material	Environment	Rating	Show all details
Nickel alloy 200	Sodium Hydroxide 72 %	A (Resistant) ≤ 0.003 mm/year	

Condition: NaCl concentration unknown | Temperature: 121.0 °C | Duration: 28 d

Localized attack:

UNE No. 160200

Reference: Corrosion Resistance of Nickel and Nickel-Containing Alloys in Caustic Soda and Other Alkalies, Corrosion Engineering Bulletin CE8-2, The International Nickel Company, Inc., 1973

Nickel alloy 200 | Sodium Hydroxide | A (Resistant) | More details

Nickel alloy 200 | Sodium Hydroxide | A (Resistant) | More details

1-Methyl-Pyrrolidine-2-One

Molecular Formula: C₅H₉NO
Element System: C-H-N-O
CAS RN: 20138-98-8, 3279-26-8, 57192-45-4, 872-98-4
MOL: NCC1=NC(=O)CCCC1=O
InChI Key: SC22C3C1CNC(=O)CCCC1=O

View 3D interactive structure

Explore this substance

View all 364 documents

Properties frequently appearing with 1-methyl-pyrrolidine-2-one:

- Density (2)
- Refractive Index (2)
- Heat of Fusion (2)
- Heat of Sublimation (2)
- Vapor-Liquid Equilibrium (7)
- Heat of Mixing (2)
- Sound Velocity (2)
- Excess Enthalpy (7)
- Phase Equilibrium (8)
- Surface Tension (1)
- Solid-Liquid Equilibrium (8)
- Heat of Solution (4)
- Refractive (2)
- Excess Volume (2)
- Mixing Enthalpy (2)
- Viscosity (2)
- Solid-Liquid Phase Equilibrium (2)
- Density (2)
- Heat Capacity (2)
- Chemical Shift (1)
- Vapor Pressure (2)
- Coupling Constant (2)
- Boiling Point (2)
- Liquid-Liquid Equilibrium (2)
- Heat of Sublimation (2)
- High-Pressure Fluid Phase Equilibrium (1)
- Latent Heat (1)
- Molar Mass (1)
- Vapor Conductivity (1)
- Molar Heat Capacity (1)
- Latent Heat (1)
- The Nuclear Magnetic Resonance Spectrum (1)
- Composites (1)
- Nuclear Magnetic Resonance (1)
- Chemical Composition (1)

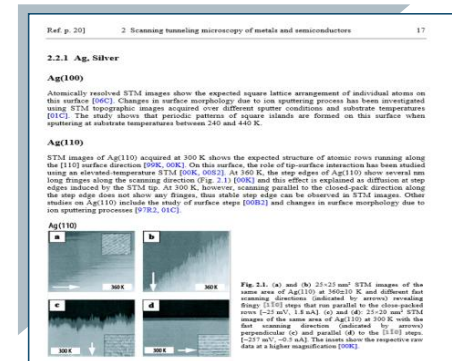
Inorganic Solid Phases

Eu₄Ga₈Ge₅ ht charge carrier mobility

General Information

Hermann Maguey Symbol(s): Pn-3
Phase Label(s): Eu₄Ga₈Ge₅ Pn-3
Structure Class(es): Pn-3
Phase Prototype: Fm-3m, aBc, aBc, aBc
Compound Class(es): intermetallic

Property	Temperature	Remark	IP ID	Reference	Crystallographic Database
$\mu_{n,0} = 1.7 \cdot 10^{-2} \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$	T = 2 K	Van Hall resistivity measurements	P110692	153877, Paschen (2001)	SD1925996
$\mu_{n,0} = 7 \cdot 10^{-2} \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$	T = 300 K	Van Hall resistivity measurements	P110692	153877, Paschen (2001)	SD1925996



数据库内容按季度更新

290,000+ 种材料, 3000+ 中性能, 600,000+ 个词条 并持续增长

主要材料类型与性质分类包括



物理



化学



热力学



电磁学



结构



机械



光谱学



原子能

SPRINGER MATERIALS 切中实质

T

文本搜索及筛选

Springer Materials

Search

Access is enabled by Springer Affiliates

Browse by collection

- Landolt-Börnstein
- Inorganic Solid Phases
- MSI Eureka
- Polymer Thermodynamics
- Substance Profile
- Thermophysical Properties

Landolt-Börnstein bookshelf

- SpringerMaterials Interactive

The research solution for identifying material properties
Fast and reliable insights accelerating materials science research

SpringerMaterials provides curated data and advanced functionalities to support research in materials science, physics, chemistry, engineering, and other related fields.

- A comprehensive database** covering multiple material classes, property types, and applications
- Enhanced data visualization** features display interactive crystal structures, data tables, and phase diagrams with export options for further analysis
- Search functions optimized for materials science** like elemental composition or chemical structure searching to quickly find material property data
- Trusted and curated resource** with thousands of materials science experts ensuring high data quality

[Learn more about how this can benefit you](#)

LATEST DEVELOPMENTS ON SPRINGER MATERIALS

Inorganic Solid Phases Updates
The latest major update in the areas of inorganic materials include approximately 11880+ crystal structures, 11,000 data values for numerous physical and chemical properties, and over 1,000 new phase diagrams for

Refine your search

Data source

- Book Profiles 1
- Corrosion 1
- Landolt-Börnstein 6
- Polymer Thermodynamics 1

Discipline

- advanced technologies 2
- electromagnetism 2
- geo- and astrophysics 1
- mechanics 4
- optics 1
- particle, nuclear and atomic physics 1
- solid-state physics 3
- thermodynamics 4

Properties

- corrosion
- cross section
- crystal structure
- density
- enthalpy
- entropy
- fluorescence
- formula unit
- Gibbs energy

9 result(s) using Focused Search for **substance: polyethylene**
If you didn't find what you were looking for, [see more results.](#)

Page 1 of 1

Book Profile

Diamagnetic Susceptibility and Anisotropy - Diamagnetic Susceptibility of Organic Compounds, Oils, Paraffins and Polyethylenes
in Landolt-Börnstein - Group II Molecules and Radicals (2008)

Landolt-Börnstein

Liquid-liquid equilibrium data of polyethylene in octamethyl cyclotetrasiloxane
This document is part of Subvolume D1 'Polymer Solutions, Physical Properties and their Relations I (Thermodynamic Properties: Phase Equilibria' of Volume 6 'Polymers' of Landolt-Börnstein Group VIII 'Advanc...

Polymer Thermodynamics

Polyethylene (PE) Heat Capacity, Enthalpy, Entropy, Gibbs Energy
Temperature Range (0.100 ... 1000.000) K

Landolt-Börnstein

Small Angle Neutron and X-Ray Scattering
This chapter explains small-angle neutron scattering (SANS) and small-angle X-Ray scattering (SAXS) and its applications to polymer. Scattering in the context of this chapter means the deflection of a beam o...

多种搜索方式



元素周期表搜索

Search by Elements

Search for information by element system

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
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Select elements from the periodic table to search by element system.

= No results in SpringerMaterials when combined with your selection

Reset

Search by Elements

Search for information by element system

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
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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)

= No results in SpringerMaterials when combined with your selection

Reset

Refine your search

45 Result(s) for **substance: nb-w**
Properties: [phase diagram](#)

Page 1 of 3

Inorganic Solid Phases

Nb-W Binary Phase Diagram 0-100 at.% W
Temperature: 2300...3500 °C (2573...3773 K); Full composition; Investigation: experimental; detailed

Inorganic Solid Phases

Nb-W Binary Phase Diagram 0-100 at.% W
Temperature: 2400...3500 °C (2673...3773 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

Inorganic Solid Phases

Nb-W Binary Phase Diagram 0-100 at.% W
Temperature: 2300...3500 °C (2573...3773 K); Full composition; Investigation: experimental; detailed

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Nb-W Binary Phase Diagram 0-100 at.% W
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- Data source**
 - Inorganic Solid Phases: 40
 - Landolt-Börnstein: 2
 - MSI Eureka: 3
- Discipline**
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 - molecules and radicals: 1
 - solid-state physics: 45
 - thermodynamics: 45
- Properties**
 - phase diagram
 - activity
 - crystal structure
 - crystallographic data
 - crystallographic model
 - enthalpy
 - entropy
 - Gibbs energy
 - integral enthalpy

多种搜索方式



化学结构输入

Search by Structure

Start by drawing a structure

Substance Profile

Benzothiazole

Molecular Formula: C₇H₅NS
 Element System: C-H-N-S
 CAS-RN: 128366-28-9, 95-16-9
 InChI: InChI=1S/C7H5NS/c1-2-4-7-6(3-1)8-5-9-7/h1-5H

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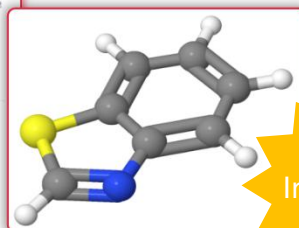
▼ Explore this substance

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Properties frequently appearing with benzothiazole

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

▶ See Less



Interactive

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腐蚀数据专业搜索

Corrosion Search

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

< 1 of 1 >

Material	Environment	Rating	Show all details
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

< 2 of 16 >

Material	Environment	Rating	Show all details
Niobium	Sulfuric Acid 98 %	A (Resistant) 5.0E-4 mm/year	
<p>Condition: Temperature: 19.0 °C - 26.0 °C Duration: 36 d</p> <p>Localised attack:</p>			
<p>UNS No: R04210 Reference: Metals Handbook, Ninth Edition, Vol 13, Corrosion, ASM International, Metals Park, OH, 1987, p 730</p> <p style="text-align: right;">^ Less details</p>			
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

**Search & Sort by
Material(s)
& Environment(s)**

生命科学相关学科

3.2

生命科学相关领域研究人员面临的三大挑战

1

实验结果的可重复性

2

难以找到相关协议和方法的内容

3

有关实验室技术和应用的信息分散



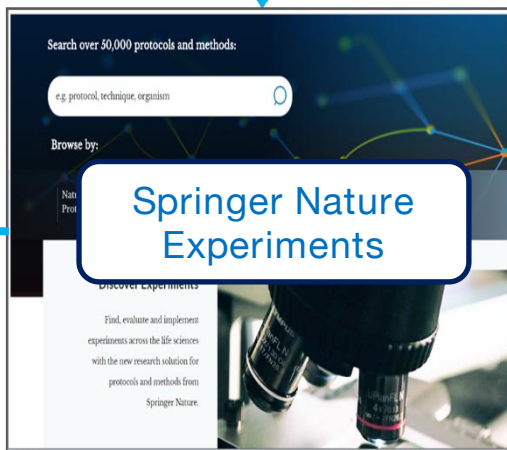
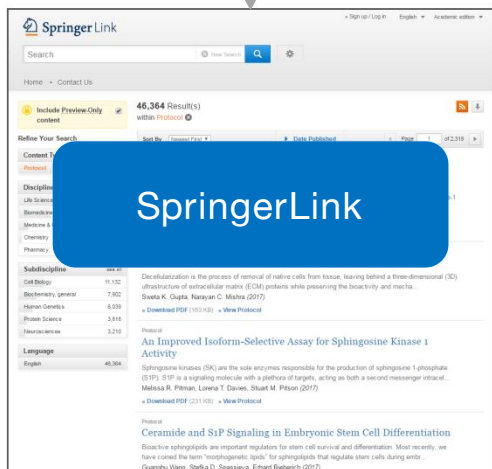
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寻找合适的实验室指南和方法效率很低

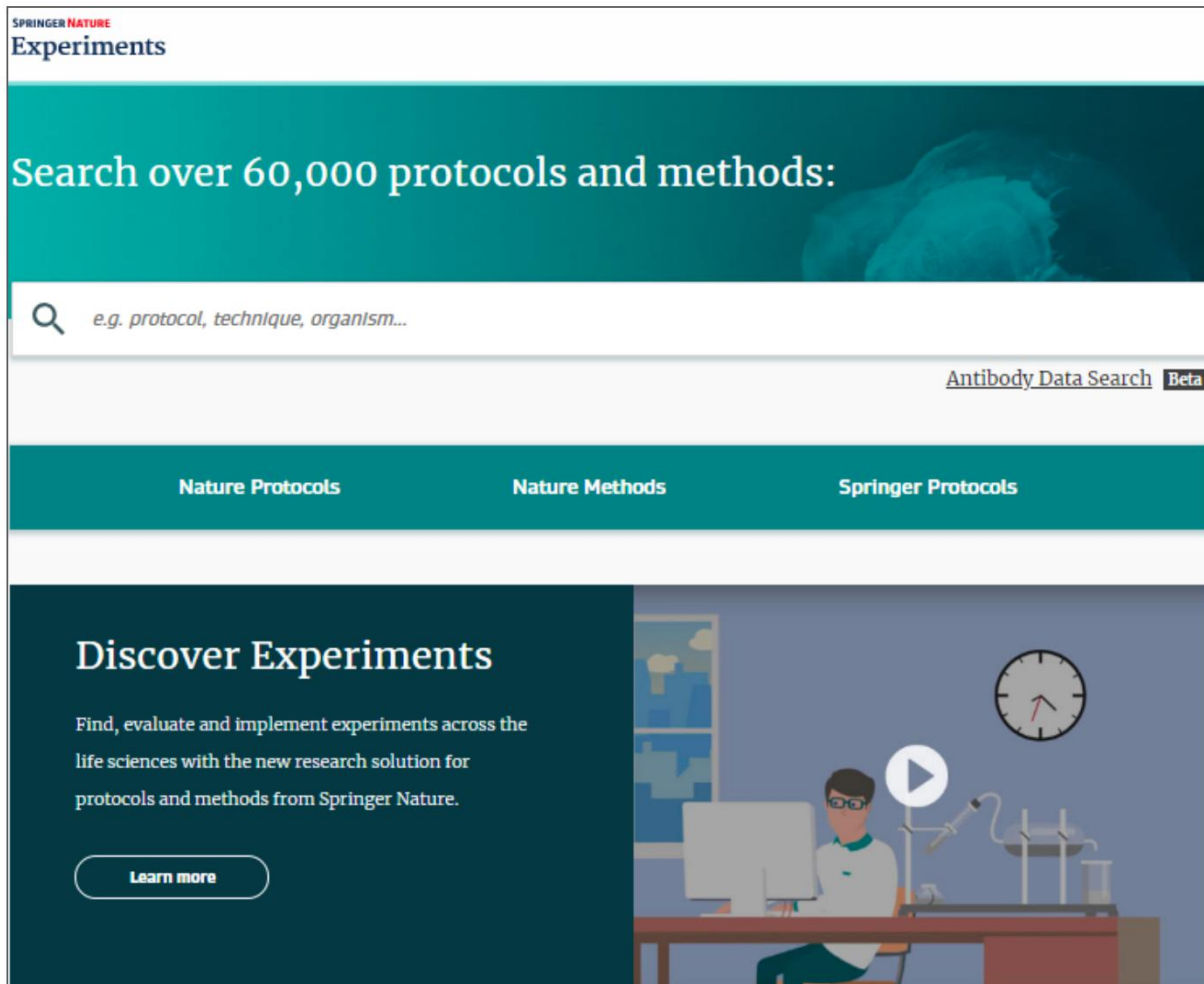


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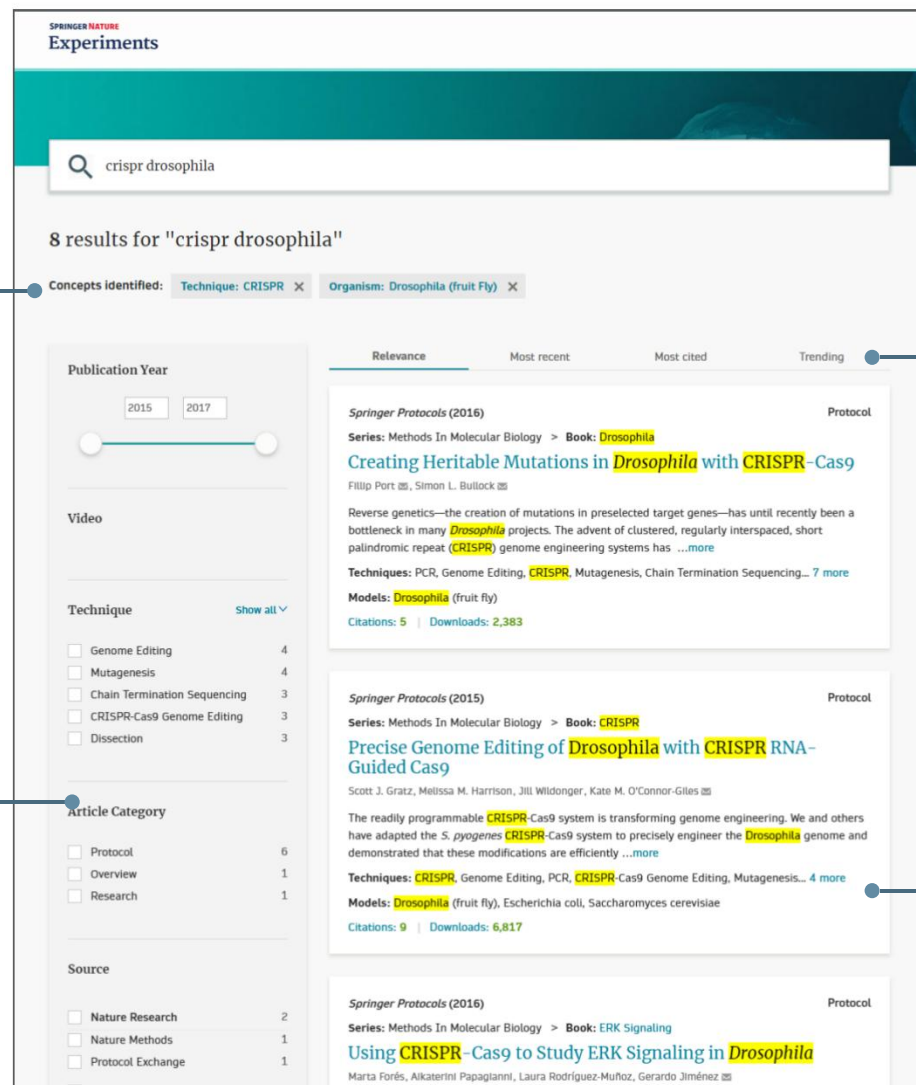
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