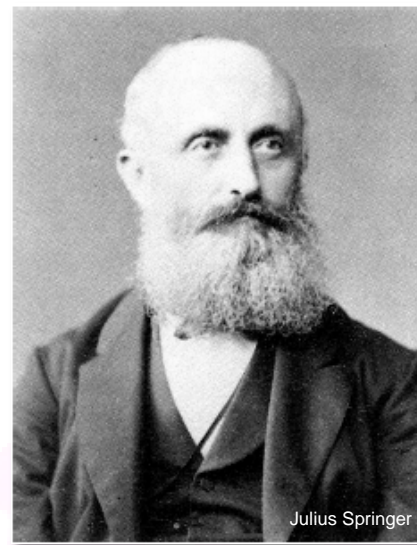


SpringerMaterials

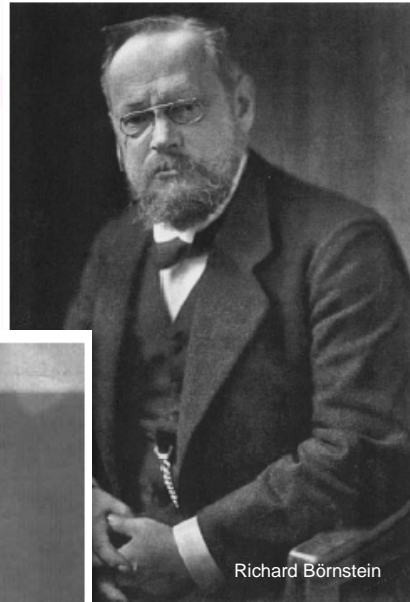
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has morphed into a web
database

Thomas Mager, Springer, 3 December 2010

It all began in 1882...



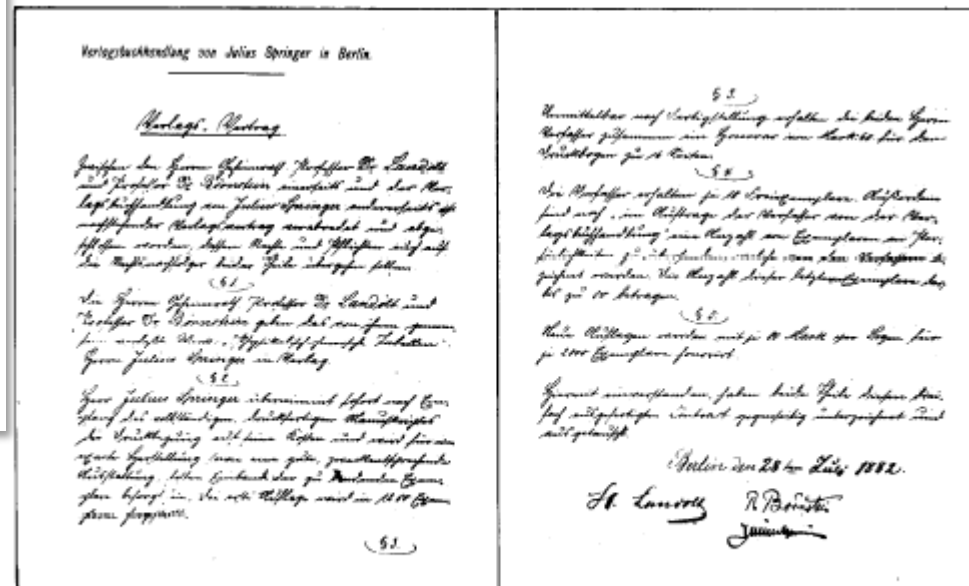
Julius Springer



Richard Börnstein



Hans Landolt

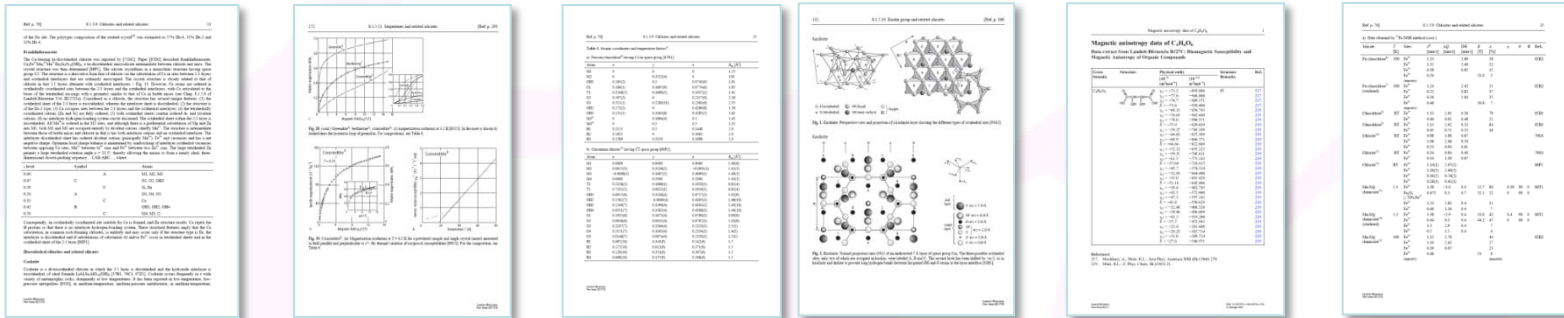


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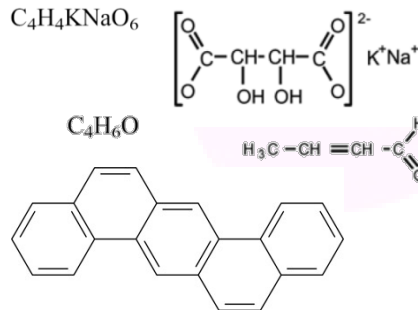


What is Landolt-Börnstein now?

- > 200,000 pages | > 100,000 online documents | > 150,000 figures



- > 250,000 chemical substances | > 1,200,000 literature references



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- Systematic and comprehensive evaluation of data by renowned authors and editors (... since 1883)



What is in Landolt-Börnstein?

1	Ar (1)	argon						7440-37-1
	CH ₄ (2)	methane						74-82-8
$x_1 = 0.000$								78M2
T/K	92.0	100.5	110.3	120.0	130.6	151.0	159.5	
$\eta /(\text{mPa s})$	0.193	0.154	0.123	0.0973	0.0802	0.0515	0.0458	
$x_1 = 0.130$								78M2
T/K	100.0	120.0	140.0					
$\eta /(\text{mPa s})$	0.174	0.106	0.071					
$x_1 = 0.144$								78M2
T/K	90.0	100.0	110.0	120.0	130.0	140.0		
$\eta /(\text{mPa s})$	0.224	0.172	0.132	0.105	0.085	0.072		
$x_1 = 0.158$								78M2
T/K	100.1	120.0	140.0					
$\eta /(\text{mPa s})$	0.170	0.102	0.070					

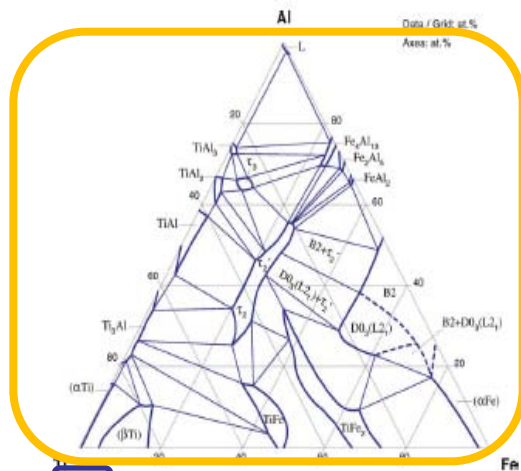


Fig. 14 Al-Fe-Ti isothermal section at 800°C

2269
ED

C₆H₆

1,3-Cyclohexadiene

C₆

r_s	Å	θ_s	deg
C(1)-H	1.09(2)	C(1)=C(2)-C(3)	120.2(8)
C(5)-H	1.10(2)	C(2)=C(1)-C(6)	120.2(8)
C(1)=C(2)	1.349(8)	C(1)-C(6)-C(5)	110.8(8)
C(2)-C(3)	1.466(14)	τ^b	18.1(10)
C(1)-C(6)	1.521(16)		
C(5)-C(6)	1.536(20)		



The molecule is twisted. The above data are average values of the data from [1] and [2].

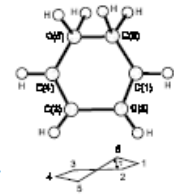
^a) Estimated limits of error, larger than those given in the original paper.

^b) Effective angle of distortion around the C(2)-C(3) bond.

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See also: Dallinga, G., Toneman, L.H.: J. Mol. Struct. 1 (1967) 11.

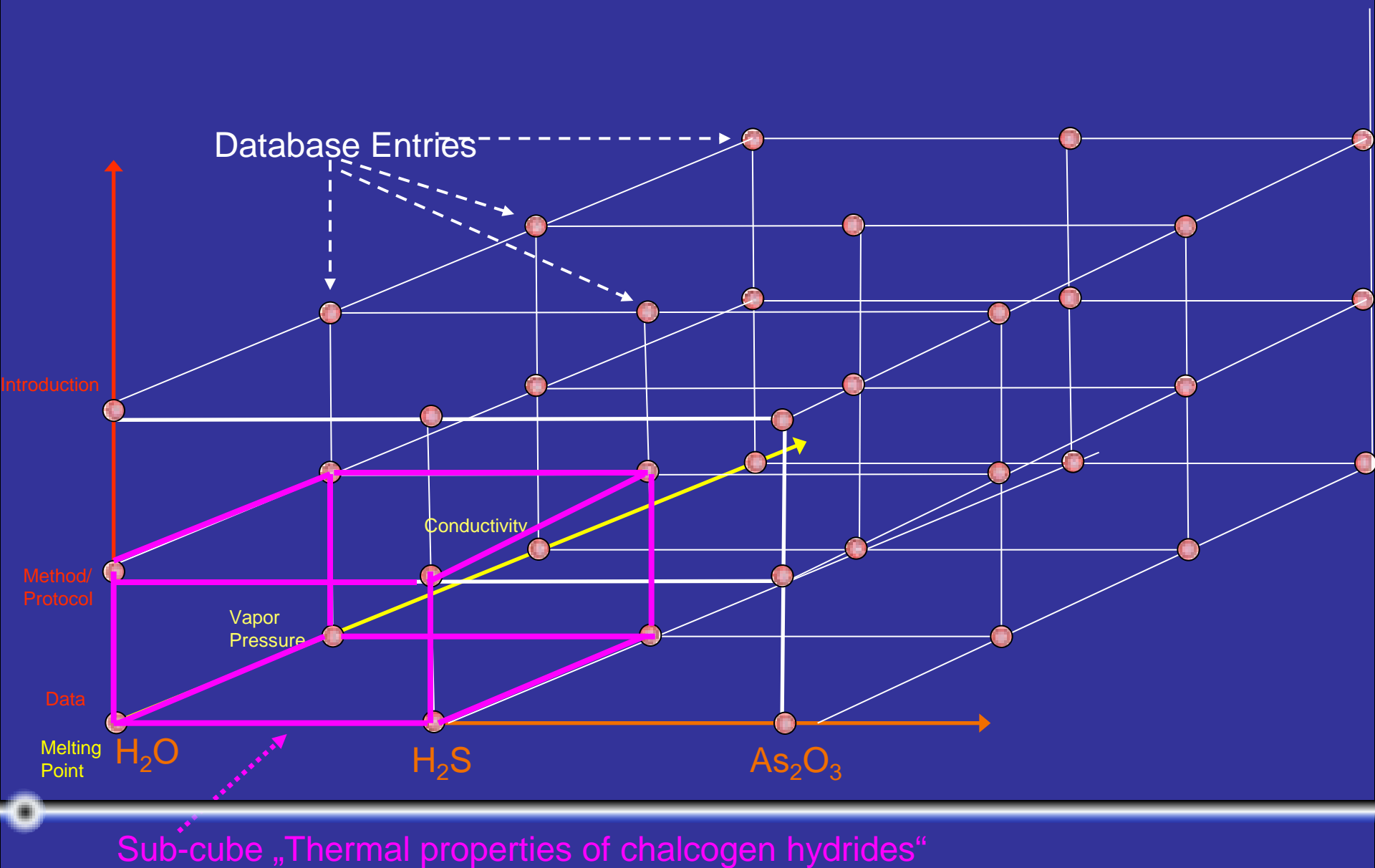


Chemical Substance

+

Physical Property

Strategy: The SpringerMaterials Database Cube



Phase/ Temperature Range [°C]	Pearson Symbol/ Group Space/ Prototype	Lattice Parameters [pm]	Comments	
TiAl ≤ 1463	<i>tP4</i> <i>P4/mmm</i> AuCu	<i>a</i> = 400.0	[2003Sch], at 50 at.% Ti.	
		<i>c</i> = 407.5	Solid solubility ranges from 33.5 to 53.3 at.% Ti [2003Sch]. [2003Sch], at 38 at.% Ti.	
		<i>a</i> = 398.4		
		<i>c</i> = 406.0		
		<i>a</i> = 399.5	[2000Mab], at Al-47 at.% Ti. Heat treated at 1000°C for 48 h followed by water quench.	
		<i>c</i> = 408.0	[1999Gor], at Al _{47.9} Fe _{1.71} Ti _{50.4}	
			<i>a</i> = 399.6	
			<i>c</i> = 407.7	
Ti ₃ Al ≤ 1164	<i>hP8</i> <i>P6₃/mmc</i> Ni ₃ Sn	<i>a</i> = 580.6	[2003Sch], at 78 at.% Ti.	
		<i>c</i> = 465.5	Solid solubility ranges from 61.8 to 80 at.% Ti [2003Sch]. [2003Sch], at 62 at.% Ti.	
			<i>a</i> = 574.6	
			<i>c</i> = 462.4	
			<i>a</i> = 576.1	[1999Gor], at Al _{36.3} Fe _{0.93} Ti _{62.8}
			<i>c</i> = 462.4	
α_1 , Fe ₂ Al ≤ 552.5	<i>cF16</i> <i>Fm$\bar{3}m$</i> BfF ₃	<i>a</i> = 578.86 to 579.3	[2003Pis], solid solubility ranges from 22.5 to 36.5 at.% Al. Labelled as <i>D0₃</i> (<i>L2₁</i>) in isothermal sections.	
α_2 , FeAl ≤ 1310	<i>cP2</i> <i>Pm$\bar{3}m$</i> CsCl	<i>a</i> = 289.76 to 290.78	[2003Pis], at room temperature solid solubility ranges from 22.0 to 54.5 at.% Al. Labelled as <i>B2</i> in isothermal sections. [1999Gor], at Al _{33.5} Fe _{5.6} Ti _{60.9} [1999Gor], at Al _{33.1} Fe _{9.5} Ti _{57.4}	
		<i>a</i> = 318.5		
		<i>a</i> = 318.5		
ϵ , Fe ₂ Al ₃ 1102-1232	<i>cI16?</i>	<i>a</i> = 598.0	[2003Pis], solid solubility ranges from 54.5 to 62.5 at.% Al	
FeAl ₂ ≤ 1156	<i>aP18</i> <i>P1</i> FeAl ₂	<i>a</i> = 487.8	[2003Pis], at 66.9 at.% Al	
		<i>b</i> = 646.1	solid solubility ranges from 65.5 to 67.0 at.% Al	
			<i>c</i> = 880.0	
			α = 91.75°	
			β = 73.27°	
			γ = 96.89°	
			<i>a</i> = 487.2	[1995Pal], contains about 1.8 at.% Ti
			<i>b</i> = 645.9	
			<i>c</i> = 879.4	
			α = 91.76°	
		β = 73.35°		
		γ = 96.89°		

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Layer 1
What the User Can See

439

Landolt-Börnstein
New Series IV/11A2
MSITe

Al-Fe-Ti

TiAl

□ 1463

tP4

P4/mmm

AuCu

a = 400.0

c = 407.5

a = 398.4

c = 406.0

a = 399.5

c = 408.0

a = 399.6

c = 407.7

a = 400.7

c = 404.9

a = 400.5

c = 404.7

[2003Sch], at 50 at.%

Ti.

Solid solubility ranges

from 33.5 to 53.3 at.%

Ti [2003Sch].

[2003Sch], at 38 at.%

Ti.

[2000Mab], at Al-47

at.% Ti.

Heat treated at 1000°C

for 48 h followed

by water quench.

[1999Gor], at

Al_{47.9}Fe_{1.7}Ti_{50.4}

[1999Gor], at

Al₄₆Fe_{2.2}Ti_{51.8}

[1999Gor], at

Al_{45.6}Fe_{1.3}Ti_{53.1}

Ti₂Al

□ 1164

hP8

P63/mmc

Ni₃Sn

a = 580.6

c = 465.5

a = 574.6

c = 462.4

a = 576.1

c = 462.4

[2003Sch], at 78 at.%

Ti.

Solid solubility ranges

from 61.8 to 80 at.% Ti

[2003Sch].

[2003Sch], at 62 at.%

Ti.

[1999Gor], at

Al_{36.3}Fe_{0.93}Ti_{62.8}

□ 1, Fe₃Al

□ 552.5

cF16

a = 318.5

a = 318.5

[2003Pis], at room

temperature

solid solubility ranges

from 22.0 to

54.5 at.% Al.

Labelled as B2 in

isothermal sections.

[1999Gor], at

Al_{33.5}Fe_{5.6}Ti_{60.9}

[1999Gor], at

Al_{33.1}Fe_{9.5}Ti_{57.4}

□, Fe₂Al₃

1102-1232

cI16? a = 598.0

[2003Pis], solid

solubility

ranges from 54.5 to

62.5 at.% Al

FeAl₂

□ 1156

aP18

P1

FeAl₂

a = 487.8

b = 646.1

c = 880.0

□ = 91.75°

□ = 73.27°

□ = 96.89°

a = 487.2

b = 645.9

c = 879.4

□ = 91.76°

□ = 73.35°

□ = 96.89°

[2003Pis], at 66.9 at.%

Al

solid solubility ranges

from 65.5 to 67.0 at.%

Al

[1995Pa], contains

about 1.8 at.% Ti

Phase/

Temperature Range

[°C]

Pearson Symbol/

Group Space/

Prototype

Lattice Parameters

[pm]

Comments

Fm3m

BIF₃

a = 578.86 to 579.3 [2003Pis], solid solubility

ranges

from 22.5 to 36.5 at.% Al.

Labelled as D0₃ (L2₁) in isothermal

sections.

□₂, FeAl

□ 1310

cP2

Fm3m

CsCl

a = 289.76 to 290.78

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Layer 2
What the SpringerLink
Search Engine Can Find


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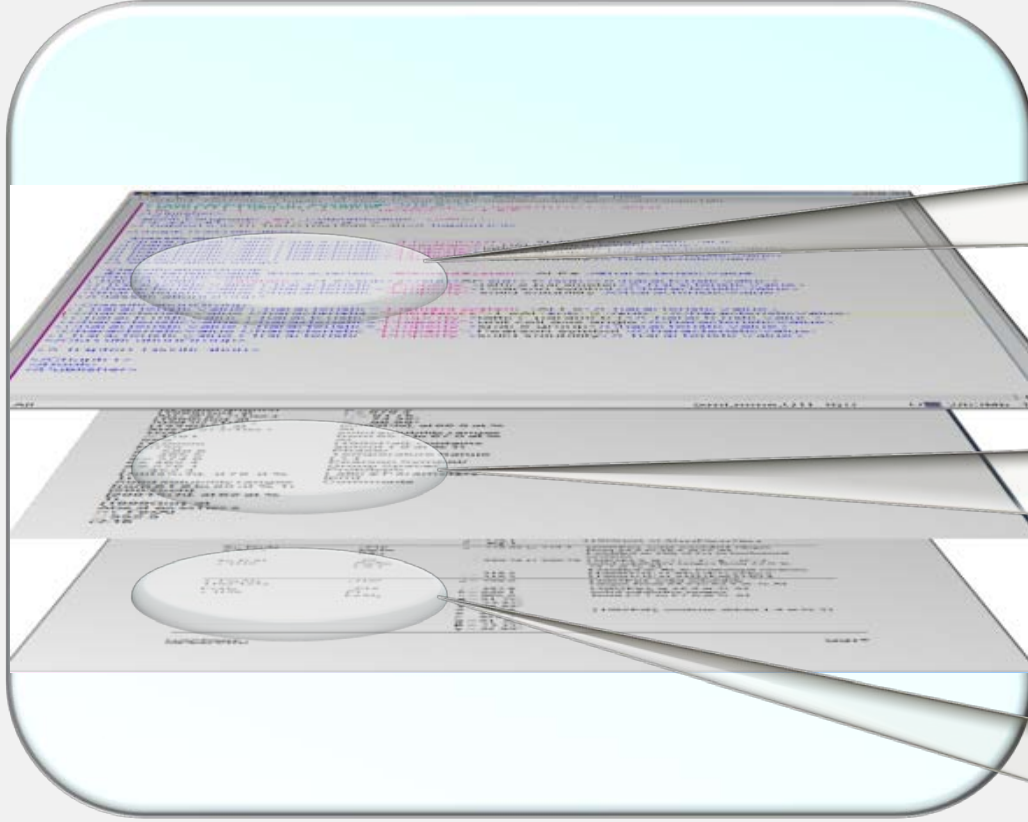
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What the SpringerMaterials
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A Closer Look

Required Resource



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Ti. *a*P18
 Solid solubility ranges from 33.5 to 53.3 at.% FeAl₂
 Ti [2003Sch]. *P*1
 [2003Sch], at 38 at.% *a* = 487.8
 Ti. *b* = 646.1
 [2000Mab], at Al-47 *c* = 880.0
 at.% Ti. $\alpha = 91.75^\circ$
 Heat treated at 1000°C $\beta = 73.27^\circ$
 for 48 h followed by water quench. $\gamma = 96.89^\circ$
 [1999Gor] at *a* = 487.2
b = 645.9
c = 879.4

FeAl ₂	<i>a</i> P18	<i>a</i> = 487.8	[2003Pis], at 66
< 1156	<i>P</i> 1	<i>b</i> = 646.1	solid solubility
	FeAl ₂	<i>c</i> = 880.0	from 65.5 to 67.
		$\alpha = 91.75^\circ$	
		$\beta = 73.27^\circ$	
		$\gamma = 96.89^\circ$	
		<i>a</i> = 487.2	[1995Pal], cont
		<i>b</i> = 645.9	
		<i>c</i> = 879.4	
		$\alpha = 91.76^\circ$	
		$\beta = 73.35^\circ$	
		$\gamma = 96.89^\circ$	

Expert knowledge-based editing process



Computerized scanning and OCR



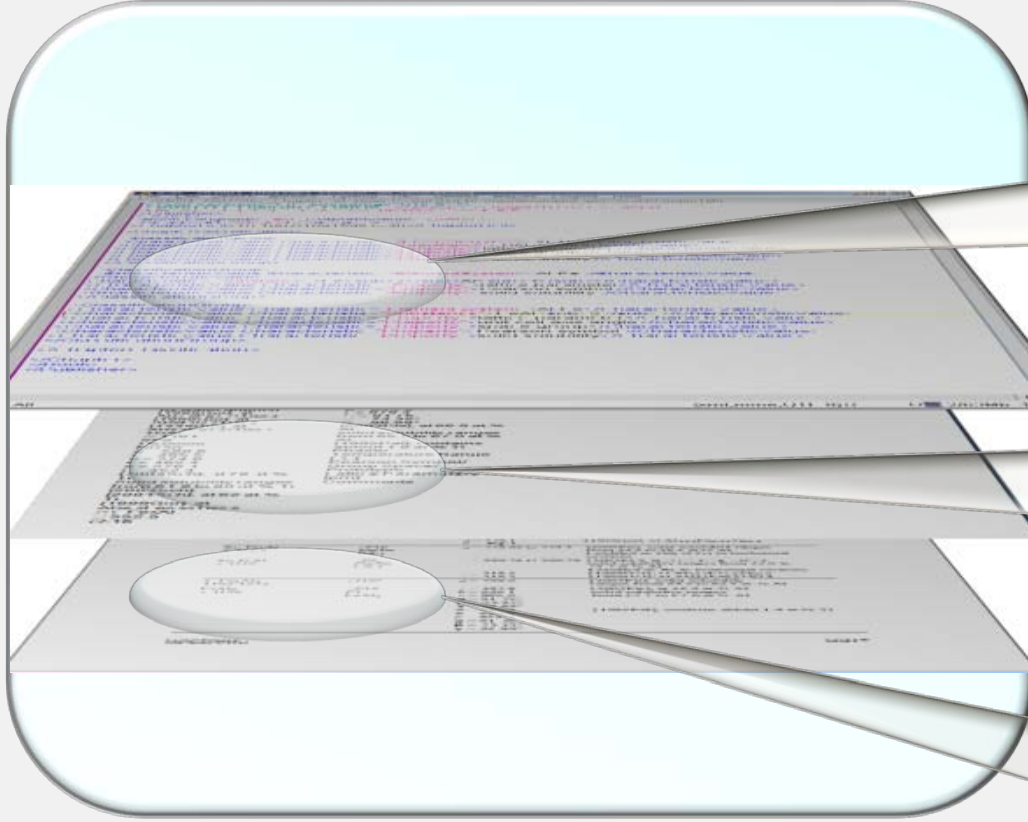
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A
Closer
Look

Index



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Ti. *a*P18
Solid solubility ranges
from 33.5 to 53.3 at.%
Ti [2003Sch].
[2003Sch], at 38 at.%
Ti.
[2000Mab], at Al-47
at.% Ti.
Heat treated at 1000°C
for 48 h followed
by water quench.
[1999Gor] at

*a*P1
FeAl₂
a = 487.8
b = 646.1
c = 880.0
 α = 91.75°
 β = 73.27°
 γ = 96.89°
a = 487.2
b = 645.9
c = 879.4

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FeAl₂
≤ 1156

*a*P18
*P*1
FeAl₂

a = 487.8
b = 646.1
c = 880.0
 α = 91.75°
 β = 73.27°
 γ = 96.89°
a = 487.2
b = 645.9
c = 879.4
 α = 91.76°
 β = 73.35°
 γ = 96.89°

[2003Pis], at 66
solid solubility
from 65.5 to 67.
[1995Pal], cont

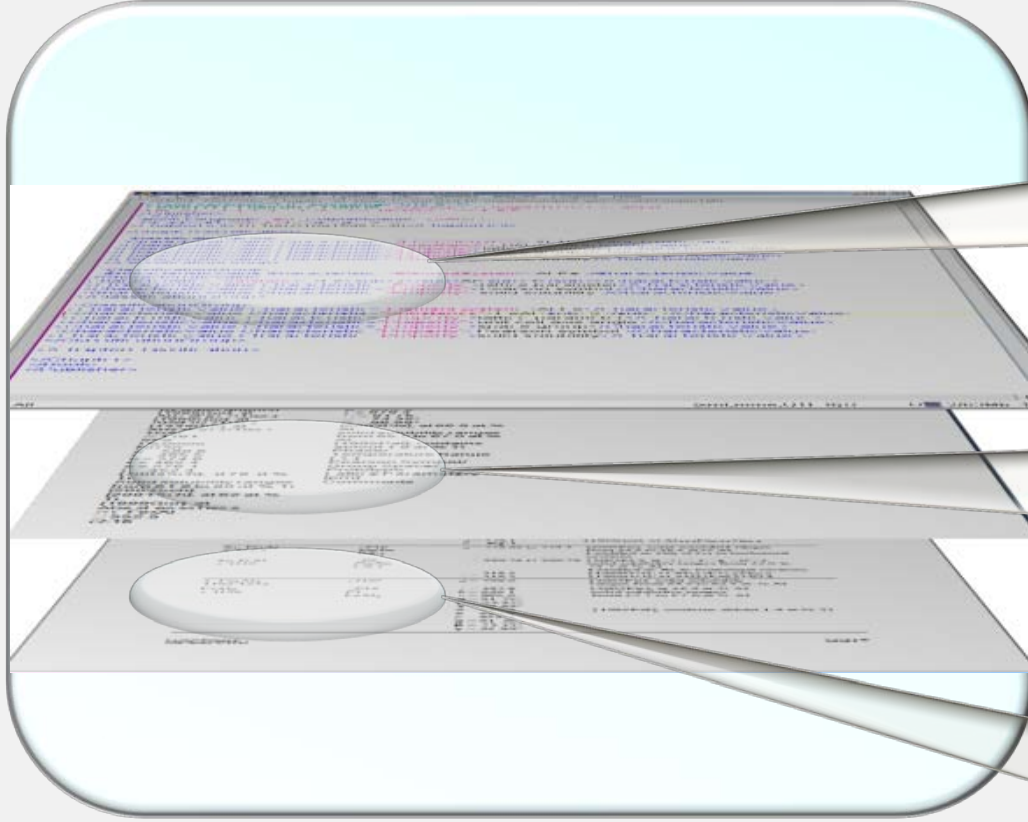
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A Closer Look

Usability

Summary



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precise search result

SpringerMaterials

What the user can find with the SpringerMaterials Search engine

Ti. $aP18$
 Solid solubility ranges from 33.5 to 53.3 at.%
 FeAl₂
 [2003Sch], at 38 at.%
 [2003Sch], at 38 at.%
 Ti. $c = 880.0$
 [2000Mab], at Al-47 at.% Ti. $\alpha = 91.75^\circ$
 Heat treated at 1000°C for 48 h followed by water quench. $\beta = 73.27^\circ$
 [1999Gor] at $\gamma = 96.89^\circ$
 $c = 879.4$

wrong search result

SpringerLink

What the user can find with the SpringerLink search engine

FeAl ₂	$aP18$	$a = 487.8$	[2003Pis], at 66
< 1156	$P1$	$b = 646.1$	solid solubility
	FeAl ₂	$c = 880.0$	from 65.5 to 67.
		$\alpha = 91.75^\circ$	
		$\beta = 73.27^\circ$	
		$\gamma = 96.89^\circ$	
		$c = 879.4$	
		$\alpha = 91.76^\circ$	
		$\beta = 73.35^\circ$	
		$\gamma = 96.89^\circ$	

easy to understand but not searchable



What the user sees

**SpringerMaterials:
You look at a PDF, you search in a database!**

Al-Fe-Ti

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0 Semiconductivity

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5 Multiphase Systems

0 Advanced Materials

0 Advanced Technologies

0 Astro- and Geophysics

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Refine

12 next

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Aluminum (Al-X-Y) Ternary Alloys

Al-Fe-Ti

Metadata: ...Al-Fe-Ti; Aluminium - Iron - Titanium; Aluminium - Iron - Titanium
Metadata: Al-Fe-Ti....

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Selected Systems from Al-B-Fe to C-Co-Fe

Aluminium - Iron - Titanium

Metadata: ...Al-Fe-Ti; Aluminium - Iron - Titanium; Aluminium - Iron - Titanium
Metadata: ...Al-Fe-Ti....

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Title Pages, Contributors, Preface, and Contents

Part 2

...Systems from Al-Cu-Fe to Al-Fe-Ti Editor G. Effenberg Authors I...

Magnetism > Actinides > Elements and Compounds

Index of substances

...Al-Fe-Th ThFe4Al8 Al-Fe-Ti FeTi_xAl1-x Ti-Fe-Al Ti0.5Fe_xAl0.5-x (Ti3Al)1-4xFe_x...

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Light Metal Systems > Aluminum (Al-X-Y) Ternary Alloys

Al-Co-Ti

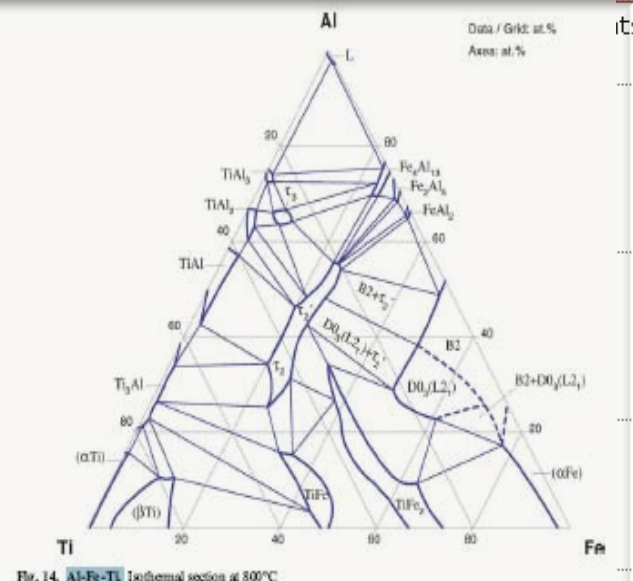
...to be similar to the Al-Fe-Ti system, assessed in the same paper and...

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Light Metal Systems > Title Pages, Contributors, Preface, and Contents

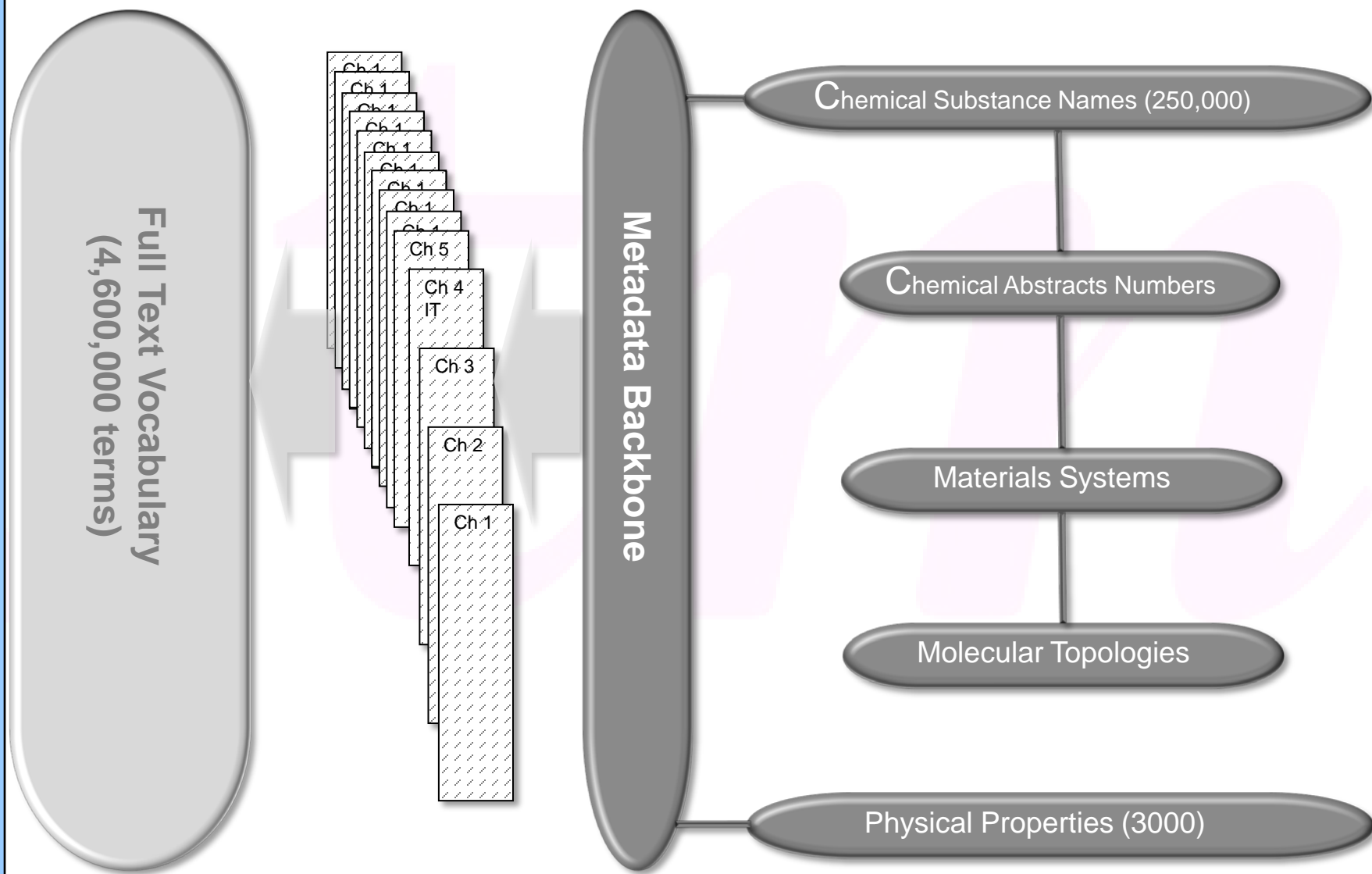
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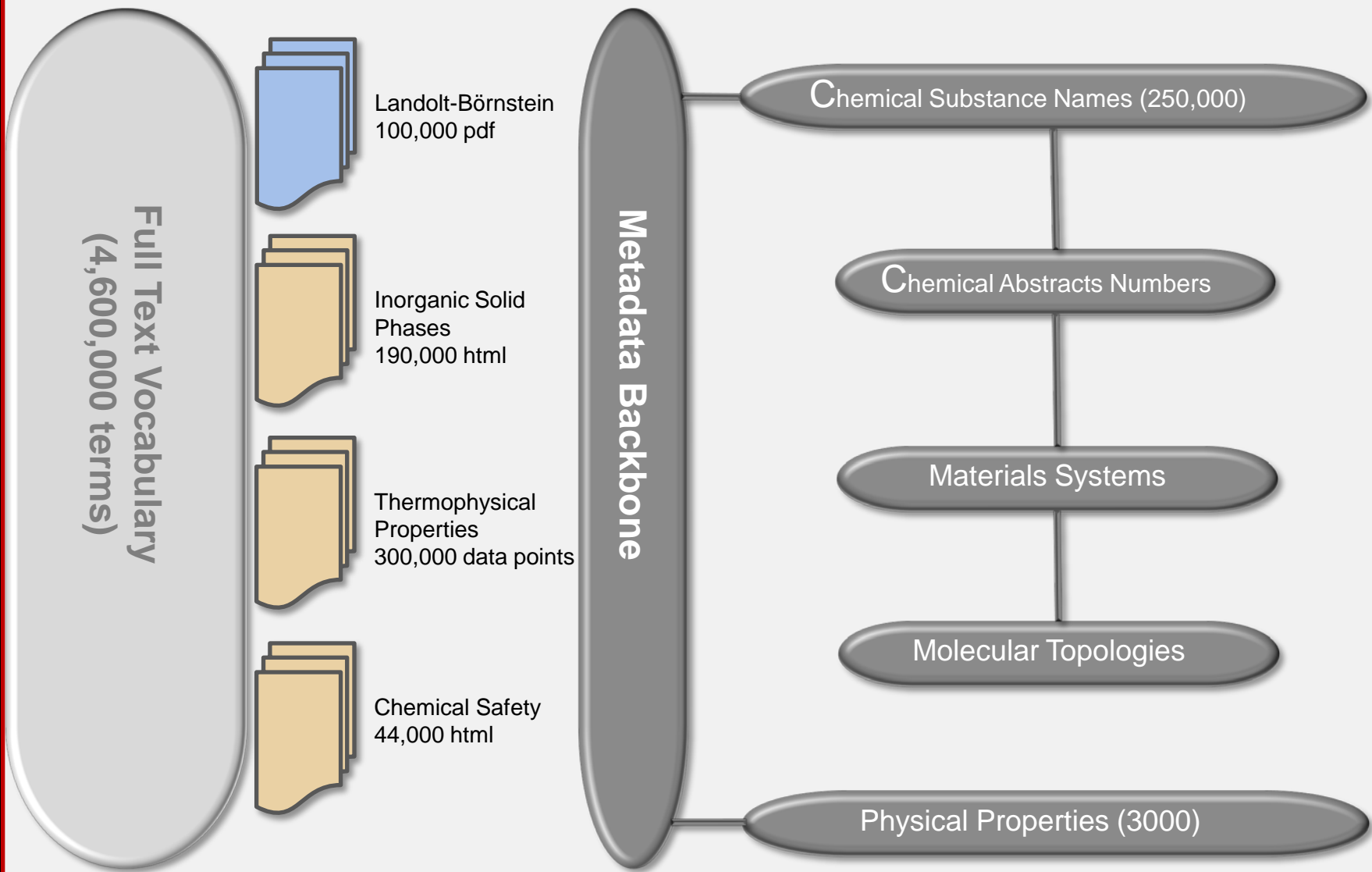
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- Al-Cr-Fe-Mg-O-Ti
- Al-Cr-Fe-Nb-Ni-Ti
- Al-Fe-H-O-Si-Ti
- Al-Fe-H-O-Ti-V
- Al-Fe-Mg-O-Si-Ti
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"Al-Fe-Ti" phase diagram

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Al-Fe-Ti  

Metadata - Substance: Al-Fe-Ti ... **Al-Fe-Ti** (Aluminium - Iron - Titanium) ... **Metadata - Property:** phase diagram ... thermodynamic phase ... **Metadata - Element System:** Al-Fe-Ti ... **Metadata - Keyword:** Phase Equilibria ... **Fulltext:** E., "The Equilibrium **Diagram** of the **Al-Fe-Ti** System and ... 10, 339-343 (1940) (Equi. **Diagram**, Experimental, #, *, 5) ... AD-43730, 1-72 (1954) (Equi. **Diagram**, Experimental, #, *) Bok, ...

Multiphase Systems > Ternary Alloys > Phase Diagrams, Crystallography and Thermodynamics > Iron Systems > Selected Systems from Al-B-Fe to C-Co-Fe

Aluminium-Iron-Titanium  

Metadata - Substance: Al-Fe-Ti ... **Al-Fe-Ti** (Aluminium - Iron - Titanium) ... **Metadata - Property:** phase diagram ... **Metadata - Element System:** Al-Fe-Ti ... **Metadata - Keyword:** solid phase ... solid phases ... **Fulltext:** carried out to determine the **phase** equilibria. Earlier ... Thermal analysis and **phase** analysis by X-ray diffraction ... only a brief review of the **phase** equilibria. [1987Men] ...

Inorganic Solid Phases

Al-Fe-Ti, ternary phase diagram, isothermal section 

Metadata - Property: phase diagram ... **Metadata - Element System:** Al-Fe-Ti ... **Fulltext:** Al-Fe-Ti, ternary **phase diagram**, ... section Element System: **Al-Fe-Ti** Inorganic Solid **Phases** · **phase diagrams Diagram** details: Al conc.[0-50 at.%] ... vs. Ti conc.[50-100 at.%] **Phase Diagram** C975737 from: Seibold A., ... Metallkd. 72 (1981) 712-719. **Diagram** details: Al conc.[0-30 wt.%] ...

Inorganic Solid Phases

Al-Fe-Ti, ternary phase diagram, vertical section 

Metadata - Property: phase diagram ... **Metadata - Element System:** Al-Fe-Ti ... **Fulltext:** Al-Fe-Ti, ternary **phase diagram**, ... Solid **Phases** · **phase diagrams Diagram** details: T[400-1800 °C] vs. ...

Inorganic Solid Phases

Al-Fe-Ti, ternary phase diagram, liquidus projection 

Metadata - Property: phase diagram ... **Metadata - Element System:** Al-Fe-Ti ... **Fulltext:** Al-Fe-Ti, ternary **phase diagram**, ... Solid **Phases** · **phase diagrams Diagram** details: Al conc.[0-100 at.%] ...

Inorganic Solid Phases

Al-Ti, binary phase diagram 

Metadata - Property: phase diagram ... **Fulltext:** Al-Ti, binary **phase diagram** Element System: Al-Ti ... Solid **Phases** · **phase diagrams Diagram**

Time's Up!

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