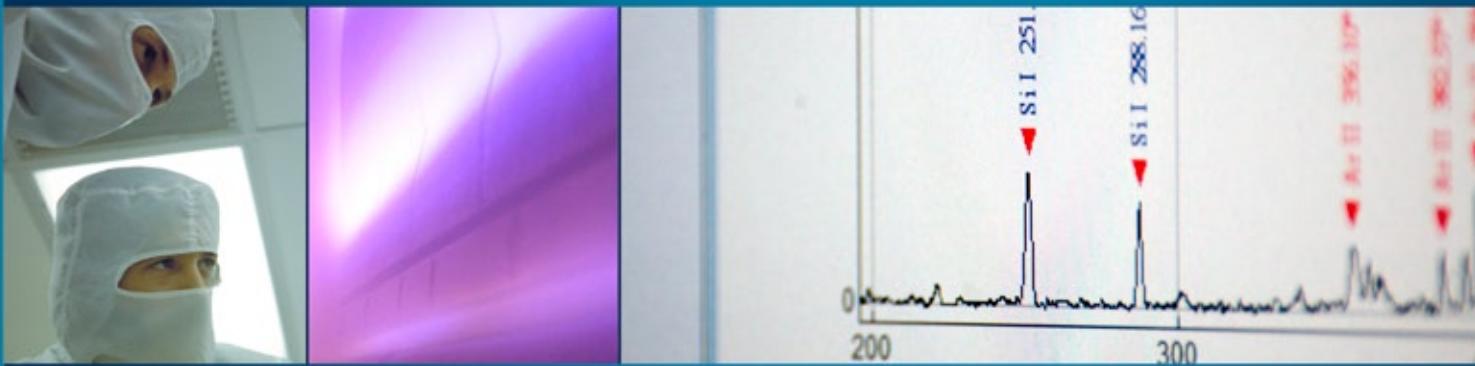


# SPECLINE

SPECTRAL LINE IDENTIFICATION FOR ATOMS AND MOLECULES



## PLASUS SPECLINE FEATURES:

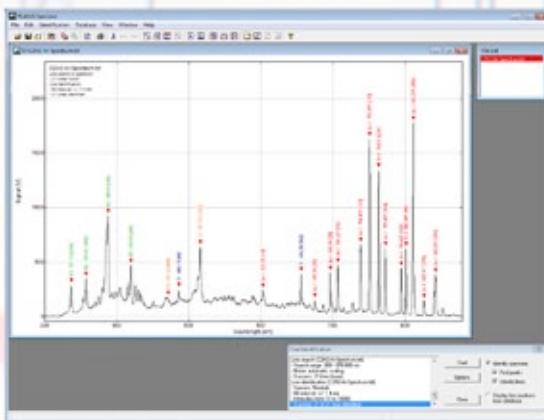
- EXTENSIVE DATABASE FOR ATOMS, IONS AND MOLECULES
- IDENTIFICATION AND EVALUATION OF SPECTRAL DATA
- DIRECT DATA IMPORT OF COMMON SPECTROSCOPIC FILE FORMATS

peak finding +++  
line identification +++  
atoms and molecules +++



Powerful software tool for analyzing spectral data.  
Designed and developed by PLASUS.

**PLASUS SpecLine** is the most powerful software tool for evaluating your spectral data. The unique database for atoms and molecules makes line identification fast and easy. Many evaluation functions will support you in analyzing and comparing your spectra. All common spectroscopic file formats are supported.



### Line identification

Identification of atoms, molecules and their ions using the included database.

### Automatic peak finding

Search algorithms for peak finding in the spectra.

### Comparison of measured data

Several spectra - even with different file formats - can be overlaid and compared.

### Data evaluation

Data smoothing, integral, scaling, peak value calibration, arithmetic of spectra (+, -, \*, /).

### Selection for database search

Periodic table for atoms, molecule list box, neutrals, ions, wavelength and intensity range.

### Database versions

A: atoms and ions

AM: atoms, ions and most of two-atomic molecules

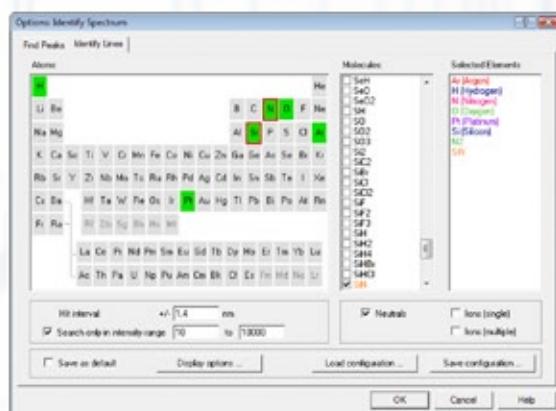
AMS: all available atoms, molecules and ions

### Configuration files

Saving and loading of search parameters.

### SpecLine file format

File format containing spectrum as well as line identification data.



### Database information

Wavelength, oscillator strength, designation, transition probabilities, energies and quantum number of upper and lower level.

### Data import

Data import formats: ASCII, Binary, EMICON, GRAMS, Ocean Optics, 4SPEC, MAPS, DaVis, WinSpec, AvaSoft, Hamamatsu and more.

### Data export

Data export to ASCII, Binary and Excel(CSV) format, graphic export to BMP, WMF and WPG format.

Line [nm]	Element	I [rel.]	Energy [eV] lower-upper	Transition lower-upper	Quantum number lower-upper	Comment
422.0515	ArI	6	11.88 - 14.96	48 1321'	- 50 1322	2 - 3
423.1955	ArI	1	11.50 - 14.96	48 1321'	- 50 1312	2 - 3
425.8952	ArI	6	11.62 - 14.74	48 1321'	- 50 1312	1 - 2
425.8957	ArI	2	11.62 - 14.33	48 1321'	- 50 1312	1 - 2
427.2195	ArI	3	11.62 - 14.32	48 1321'	- 50 1312	1 - 1
430.2101	ArI	2	11.62 - 14.31	48 1321'	- 50 1312	1 - 2
433.2051	ArI	3	11.50 - 14.99	48 1321'	- 50 1312	1 - 2
433.2350	ArI	2	11.62 - 14.99	48 1321'	- 50 1312	1 - 1
434.5168	ArI	1	11.62 - 14.96	48 1321'	- 50 1312	1 - 1
434.0166	H	15	10.20 - 10.96	2p 3P	- 3s 1S	1/2 - 1/2
431.4200	OH	100	0.00 - 2.87	X7P	- CPW	0 - 0
432.4000	OH	800	0.00 - 2.87	X7P	- CPW	2 - 2
432.2500	N2	600	7.29 - 11.05	CPWg	- CPW	6 - 2
432.4700	N2	300	7.29 - 11.05	CPWg	- CPW	8 - 1
431.8800	N2	200	0.00 - 5.22	X7P6/5	- CPW	10 - 1
431.3800	N2	400	7.29 - 11.05	CPWg	- CPW	4 - 0

More information and a free trial version are available on our website: [www.plasus.de](http://www.plasus.de).

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April 2018



**PLASUS SpecLine**

Version 2.1

**Content of Database for Version:**

**SpecLine A**

**SpecLine AM**

**SpecLine AMS**

## Atoms in PLASUS SpecLine A, AM and AMS:

The ionisation states are given in spectroscopic notation: 'I' denotes neutrals, 'II' single ionized elements, 'III' double ionized elements, etc..

Z	Element	Symbol	Ionisation state
1	Hydrogen	H, D, T	I
2	Helium	He	I - II
3	Lithium	Li	I - III
4	Beryllium	Be	I - IV
5	Boron	B	I - V
6	Carbon	C	I - V
7	Nitrogen	N	I - VII
8	Oxygen	O	I - VII
9	Fluorine	F	I - VIII
10	Neon	Ne	I - IX
11	Sodium	Na	I - IX
12	Magnesium	Mg	I - XII
13	Aluminum	Al	I - XIII
14	Silicon	Si	I - XII
15	Phosphorus	P	I - XIII
16	Sulfur	S	I - XVI
17	Chlorine	Cl	I - X
18	Argon	Ar	I - XIV
19	Potassium	K	I - XIV
20	Calcium	Ca	I - XV
21	Scandium	Sc	I - XXI
22	Titanium	Ti	I - XXI
23	Vanadium	V	I - XXII
24	Chromium	Cr	I - XXIII
25	Manganese	Mn	I - XXIV
26	Iron	Fe	I - XXV
27	Cobalt	Co	I - XXVI
28	Nickel	Ni	I - XXVII
29	Copper	Cu	I - V
30	Zinc	Zn	I - IV
31	Gallium	Ga	I - V
32	Germanium	Ge	I - V
33	Arsenic	As	I - V
34	Selenium	Se	I - V
35	Bromine	Br	I - V
36	Krypton	Kr	I - VIII
37	Rubidium	Rb	I - IV
38	Strontium	Sr	I - V
39	Yttrium	Y	I - V
40	Zirconium	Zr	I - V
41	Niob	Nb	I - V
42	Molybdenum	Mo	I - IV
43	Technetium	Tc	I - II
44	Ruthenium	Ru	I - III
45	Rhodium	Rh	I - III
46	Palladium	Pd	I - III
47	Silver	Ag	I - III
48	Cadmium	Cd	I - IV
49	Indium	In	I - V
50	Tin	Sn	I - V
51	Antimon	Sb	I - V

Z	Element	Symbol	Ionisation state
52	Tellurium	Te	I - II
53	Iodine	I	I - V
54	Xenon	Xe	I - VIII
55	Cesium	Cs	I - IV
56	Barium	Ba	I - V
57	Lanthanum	La	I - V
58	Cerium	Ce	I - V
59	Praseodymium	Pr	I - V
60	Neodymium	Nd	I - II
61	Promethium	Pm	I - II
62	Samarium	Sm	I - II
63	Europium	Eu	I - III
64	Gadolinium	Gd	I - IV
65	Terbium	Tb	I - IV
66	Dysprosium	Dy	I - II
67	Holmium	Ho	I - II
68	Erbium	Er	I - III
69	Thulium	Tm	I - III
70	Ytterbium	Yb	I - IV
71	Lutetium	Lu	I - V
72	Hafnium	Hf	I - V
73	Tantalum	Ta	I - V
74	Tungsten	W	I - II
75	Rhenium	Re	I - II
76	Osmium	Os	I - II
77	Iridium	Ir	I - II
78	Platinum	Pt	I - II
79	Gold	Au	I - III
80	Mercury	Hg	I - III
81	Thallium	Tl	I - IV
82	Lead	Pb	I - V
83	Bismuth	Bi	I - V
84	Polonium	Po	I
85	Astatine	At	I
86	Radon	Rn	I
87	Francium	Fr	I
88	Radium	Ra	I - II
89	Actinium	Ac	I - IV
90	Thorium	Th	I - IV
91	Protactinium	Pa	I - II
92	Uranium	U	I - II
93	Neptunium	Np	I
94	Plutonium	Pu	I - II
95	Americium	Am	I - II
96	Curium	Cm	I - II
97	Berkelium	Bk	I - II
98	Californium	Cf	I - II
99	Einsteinium	Es	I - II

## Molecules in PLASUS SpecLine AM and AMS:

Element	Molecules
Silver molecules	$\text{Ag}_2$ , $\text{AgCl}$ , $\text{AgF}$ , $\text{AgH}$ , $\text{AgO}$
Aluminum molecules	$\text{Al}_2$ , $\text{AlCl}$ , $\text{AlF}$ , $\text{AlH}$ , $\text{AlH}^+$ , $\text{AlN}$ , $\text{AlO}$ , $\text{AlS}$
Arsenic molecules	$\text{As}_2$ , $\text{AsCl}$ , $\text{AsF}$ , $\text{AsH}$ , $\text{AsN}$ , $\text{AsO}$ , $\text{AsO}^+$ , $\text{AsP}$ , $\text{AsS}$ , $\text{AsS}^+$
Gold molecules	$\text{Au}_2$ , $\text{AuCl}$ , $\text{AuH}$
Boron molecules	$\text{B}_2$ , $\text{BCl}$ , $\text{BF}$ , $\text{BH}$ , $\text{BH}^+$ , $\text{BN}$ , $\text{BO}$ , $\text{BO}^+$ , $\text{BS}$
Barium molecules	$\text{BaCl}$ , $\text{BaF}$ , $\text{BaH}$ , $\text{BaO}$ , $\text{BaS}$
Beryllium molecules	$\text{BeCl}$ , $\text{BeF}$ , $\text{BeH}$ , $\text{BeH}^+$ , $\text{BeO}$ , $\text{BeS}$
Carbon molecules	$\text{C}_2$ , $\text{C}_2^+$ , $\text{C}_2^-$ , $\text{C}_3$ , $\text{CCl}$ , $\text{CF}$ , $\text{CF}_2$ , $\text{CH}$ , $\text{CH}^+$ , $\text{CH}_2$ , $\text{CH}_3$ , $\text{CN}$ , $\text{CN}^+$ , $\text{CN}_2$ , $\text{C}_2\text{N}$ , $\text{C}_2\text{N}_2$ , $\text{CO}$ , $\text{CO}^+$ , $\text{CO}_2$ , $\text{CO}_2^+$ , $\text{CP}$ , $\text{CS}$ , $\text{CS}_2$ , $\text{CS}_2^+$
Calcium molecules	$\text{CaCl}$ , $\text{CaF}$ , $\text{CaH}$ , $\text{CaO}$ , $\text{CaS}$
Cadmium molecules	$\text{CdCl}$ , $\text{CdF}$ , $\text{CdH}$ , $\text{CdH}^+$
Chlorine molecules	$\text{Cl}_2$ , $\text{Cl}_2^+$ , $\text{ClF}$ , $\text{ClO}$
Chromium molecules	$\text{CrCl}$ , $\text{CrF}$ , $\text{CrH}$ , $\text{CrO}$ , $\text{CrS}$
Copper molecules	$\text{Cu}_2$ , $\text{CuCl}$ , $\text{CuF}$ , $\text{CuH}$ , $\text{CuO}$ , $\text{CuS}$
Fluorine molecules	$\text{F}_2$ , $\text{F}_2^+$
Iron molecules	$\text{FeCl}$ , $\text{FeF}$ , $\text{FeO}$
Gallium molecules	$\text{Ga}_2$ , $\text{GaCl}$ , $\text{GaF}$ , $\text{GaH}$ , $\text{GaO}$
Germanium molecules	$\text{GeCl}$ , $\text{GeF}$ , $\text{GeH}$ , $\text{GeO}$ , $\text{GeS}$
Hydrogen molecules	$\text{HCN}$ , $\text{HCl}$ , $\text{HCl}^+$ , $\text{HF}$ , $\text{HF}^+$ , $\text{H}_2\text{O}$ , $\text{H}_2\text{O}^+$
Helium molecules	$\text{He}_2$ , $\text{HeNe}$
Mercury molecules	$\text{Hg}_2$ , $\text{Hg}_2^+$ , $\text{HgCl}$ , $\text{HgF}$ , $\text{HgH}$ , $\text{HgH}^+$
Indium molecules	$\text{In}_2$ , $\text{InCl}$ , $\text{InF}$ , $\text{InH}$ , $\text{InO}$ , $\text{InO}^+$
Potassium molecules	$\text{K}_2$
Lithium molecules	$\text{Li}_2$ , $\text{LiCl}$ , $\text{LiH}$
Magnesium molecules	$\text{Mg}_2$ , $\text{MgCl}$ , $\text{MgF}$ , $\text{MgH}$ , $\text{MgH}^+$ , $\text{MgO}$ , $\text{MgS}$
Nitrogen molecules	$\text{N}_2$ , $\text{N}_2^+$ , $\text{NCI}$ , $\text{NF}$ , $\text{NH}$ , $\text{NH}^+$ , $\text{NH}_2$ , $\text{NO}$ , $\text{NO}_2$ , $\text{N}_2\text{O}$ , $\text{N}_2\text{O}^+$ , $\text{NS}$ , $\text{NS}^+$
Sodium molecules	$\text{Na}_2$ , $\text{NaF}$ , $\text{NaH}$ , $\text{NaK}$
Neon molecules	$\text{Ne}_2$
Nickel molecules	$\text{NiCl}$ , $\text{NiF}$ , $\text{NiH}$ , $\text{NiO}$
Oxygen molecules	$\text{O}_2$ , $\text{O}_2^+$ , $\text{O}_3$ , $\text{OH}$ , $\text{OH}^+$
Phosphorus molecules	$\text{P}_2$ , $\text{P}_2^+$ , $\text{PCl}$ , $\text{PF}$ , $\text{PF}^+$ , $\text{PH}$ , $\text{PH}^+$ , $\text{PN}$ , $\text{PO}$ , $\text{PO}^+$ , $\text{PS}$ , $\text{PS}^+$
Platinum molecules	$\text{PtC}$ , $\text{PtH}$ , $\text{PtO}$
Sulfur molecules	$\text{S}_2$ , $\text{SF}$ , $\text{SH}$ , $\text{SH}^+$ , $\text{SO}$ , $\text{SO}_2$ , $\text{S}_2\text{O}$
Selenic molecules	$\text{Se}_2$ , $\text{SeCl}$ , $\text{SeH}$ , $\text{SeO}$ , $\text{SeS}$
Silicon molecules	$\text{Si}_2$ , $\text{SiC}_2$ , $\text{SiCl}$ , $\text{SiF}$ , $\text{SiH}$ , $\text{SiH}^+$ , $\text{SiH}_2$ , $\text{SiN}$ , $\text{SiO}$ , $\text{SiO}^+$ , $\text{SiO}_2$ , $\text{SiS}$
Tin molecules	$\text{SnCl}$ , $\text{SnF}$ , $\text{SnH}$ , $\text{SnO}$ , $\text{SnS}$
Strontium molecules	$\text{SrCl}$ , $\text{SrF}$ , $\text{SrH}$ , $\text{SrO}$
Tantalum molecules	$\text{TaO}$ , $\text{TaO}^+$
Titanium molecules	$\text{TiCl}$ , $\text{TiF}$ , $\text{TiH}$ , $\text{TiN}$ , $\text{TiO}$ , $\text{TiS}$
Vanadium molecules	$\text{VCl}$ , $\text{VH}$ , $\text{VO}$
Tungsten molecules	$\text{WO}$
Zinc molecules	$\text{Zn}_2$ , $\text{ZnCl}$ , $\text{ZnF}$ , $\text{ZnH}$ , $\text{ZnH}^+$ , $\text{ZnO}$

## Additional molecules in PLASUS SpecLine AMS:

Element	Molecules
Silver molecules	AgBr
Aluminum molecules	AlBr
Arsenic molecules	AsH <sub>2</sub>
Boron molecules	BBr, BO <sub>2</sub> , BOF <sub>2</sub>
Bromine molecules	Br <sub>2</sub> , Br <sub>2</sub> <sup>+</sup> , BrCl, BrF, BrO
Carbon molecules	CBr, CHCl, CHF, CHNO, CHNS, CHO, CHOCHO, CHOF, CHOOH, CH <sub>2</sub> O, CH <sub>2</sub> CHCHO, CH <sub>3</sub> Br, CH <sub>3</sub> Cl, CH <sub>3</sub> NO <sub>2</sub> , CH <sub>3</sub> O, C <sub>2</sub> H <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>4</sub> O, C <sub>2</sub> H <sub>5</sub> , C <sub>2</sub> H <sub>5</sub> CHO, C <sub>2</sub> H <sub>5</sub> NO <sub>2</sub> , C <sub>3</sub> H <sub>3</sub> , C <sub>3</sub> H <sub>5</sub> , C <sub>3</sub> H <sub>6</sub> O, C <sub>4</sub> H <sub>2</sub> , C <sub>4</sub> H <sub>2</sub> <sup>+</sup> , C <sub>5</sub> H <sub>5</sub> , C <sub>6</sub> H <sub>5</sub> , C <sub>6</sub> H <sub>5</sub> Cl, C <sub>6</sub> H <sub>5</sub> F, C <sub>6</sub> H <sub>5</sub> CHO, C <sub>6</sub> H <sub>5</sub> OH, C <sub>6</sub> H <sub>6</sub> , C <sub>7</sub> H <sub>7</sub> , C <sub>10</sub> H <sub>8</sub> , CF <sub>3</sub> NO, C <sub>3</sub> F <sub>7</sub> NO <sub>2</sub> , C <sub>3</sub> F <sub>7</sub> NO, CF <sub>3</sub> NO <sub>2</sub> , COCl <sub>2</sub> , C <sub>2</sub> O, C <sub>3</sub> O <sub>2</sub> , COS, COS <sup>+</sup> , C <sub>3</sub> S <sub>2</sub>
Calcium molecules	CaBr, CaOH
Cadmium molecules	CdBr
Cerium molecules	CeO
Chlorine molecules	ClF <sub>3</sub> , ClO <sub>2</sub>
Chromium molecules	CrBr
Copper molecules	CuBr, CuOH
Fluorine molecules	FCO, F <sub>2</sub> CO
Iron molecules	FeBr
Gallium molecules	GaBr
Germanium molecules	GeBr
Hydrogen molecules	H <sub>2</sub> , HBr, HBr <sup>+</sup> , HCP, HNF, HNO, HNO <sub>2</sub> , HS <sub>2</sub> , H <sub>2</sub> S, H <sub>2</sub> S <sup>+</sup>
Mercury molecules	HgBr, HgBr <sub>2</sub> , HgCl <sub>2</sub>
Indium molecules	InBr, InBr <sub>2</sub> , InCl <sub>2</sub>
Lithium molecules	LiBr
Magnesium molecules	MgBr, MgOH
Nitrogen molecules	N <sub>3</sub> , NCO, NCS, NCl <sub>2</sub> , NF <sub>2</sub> , NH <sub>3</sub> , N <sub>2</sub> H <sub>2</sub> , N <sub>2</sub> H <sub>4</sub> , NO <sub>3</sub> , N <sub>2</sub> O <sub>3</sub> , N <sub>2</sub> O <sub>4</sub> , N <sub>2</sub> O <sub>5</sub> , NSF
Nickel molecules	NiBr
Phosphorus molecules	PH <sub>2</sub> PH <sub>3</sub> , PHO, POBr, POBr <sub>2</sub> , POCl, POCl <sub>2</sub>
Sulfur molecules	S <sub>3</sub> , S <sub>4</sub> , SO <sub>3</sub>
Selenic molecules	SeBr, SeBr <sub>2</sub> , SeCl <sub>2</sub> , SeO <sub>2</sub>
Silicon molecules	SiBr, SiBr <sup>+</sup> , SiHBr, SiCl <sub>2</sub> , SiHCl, SiF <sub>2</sub> , SiF <sub>3</sub> , SiH
Tin molecules	SnBr
Strontium molecules	SrBr, SrOH
Titanium molecules	TiBr
Zinc molecules	ZnBr

PLASUS GmbH, April 2018. Specifications are subject to change without notice.