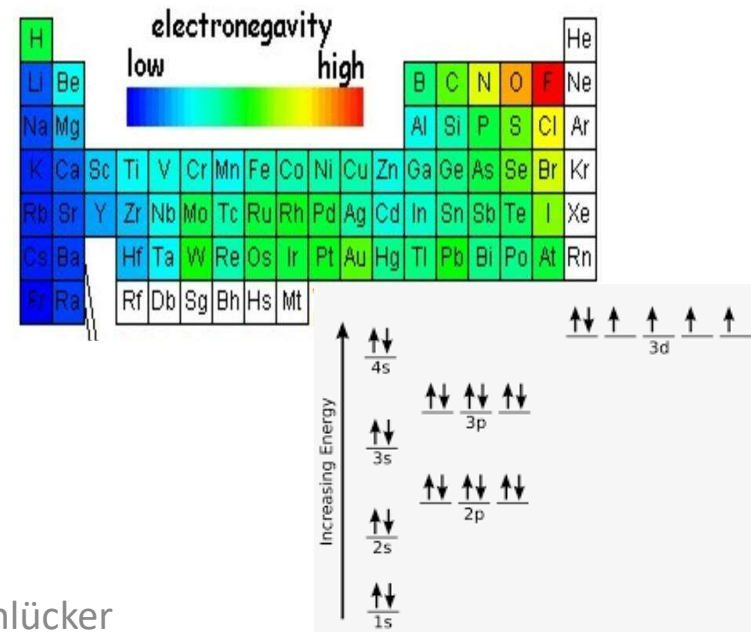


1. Wie bestimmt man die Ionisierungsenergie?
2. Wie bestimmt man die Elektronegativität?
3. **Wie bestimmt man die Elektronenkonfiguration?**



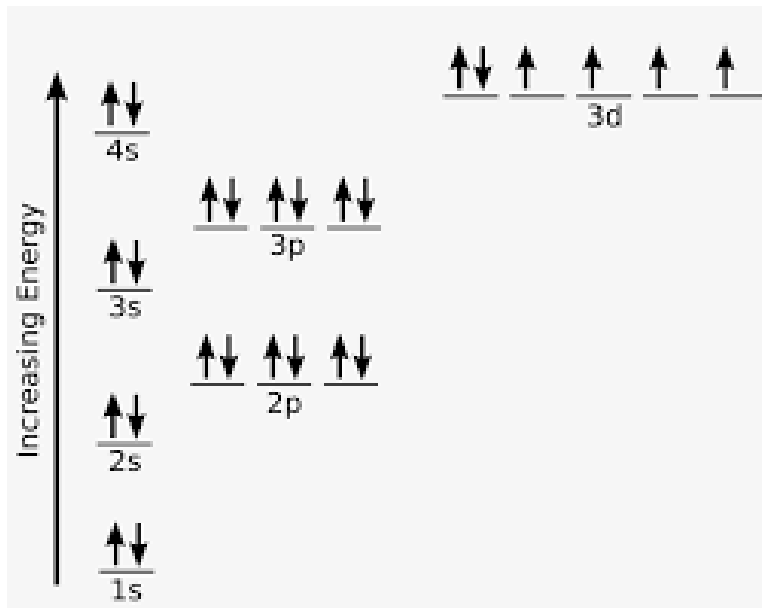
# 0. Was ist die Elektronenkonfiguration?

**Die Elektronenkonfiguration gibt die  
Verteilung aller Elektronen  
auf die diskreten Energieniveaus in einem Atom an.**

# 0. Was ist die Elektronenkonfiguration?

Die Elektronenkonfiguration gibt die Verteilung aller Elektronen auf die diskreten Energieniveaus in einem Atom an.

weiter weg  
vom  
Atomkern



kernnah

Die Energie steigt von unten nach oben an.  
Jede horizontale Stufe steht für eine erreichbare Energie

= **Energieniveau**

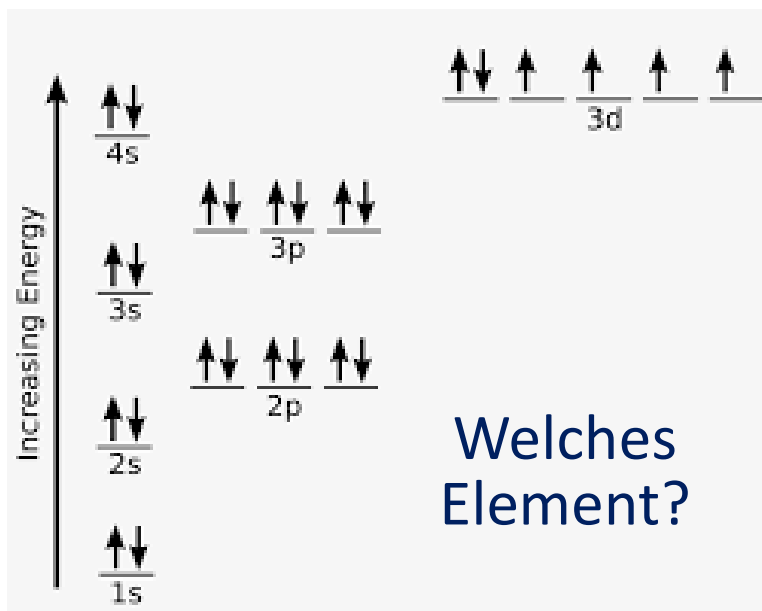
(im Schalenmodell: Unterschale;  
quantenmechanisch: Atomorbital  
= Einelektronenwellenfunktion).

Jedes Elektron ist durch einen Pfeil  
nach unten oder nach oben gekennzeichnet

1 <b>H</b> Hydrogen 1.008											13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	2 <b>He</b> Helium 4.003	
3 <b>Li</b> Lithium 6.941	4 <b>Be</b> Beryllium 9.012											5 <b>B</b> Boron 10.811	6 <b>C</b> Carbon 12.011	7 <b>N</b> Nitrogen 14.007	8 <b>O</b> Oxygen 15.999	9 <b>F</b> Fluorine 18.998	10 <b>Ne</b> Neon 20.180
11 <b>Na</b> Sodium 22.99	12 <b>Mg</b> Magnesium 24.305	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8	9 VIII 8	10	11 IB 1B	12 IIB 2B	13 <b>Al</b> Aluminum 26.982	14 <b>Si</b> Silicon 28.086	15 <b>P</b> Phosphorus 30.974	16 <b>S</b> Sulfur 32.066	17 <b>Cl</b> Chlorine 35.453	18 <b>Ar</b> Argon 39.948
19 <b>K</b> Potassium 39.098	20 <b>Ca</b> Calcium 40.078	21 <b>Sc</b> Scandium 44.956	22 <b>Ti</b> Titanium 47.867	23 <b>V</b> Vanadium 50.942	24 <b>Cr</b> Chromium 51.996	25 <b>Mn</b> Manganese 54.938	26 <b>Fe</b> Iron 55.845	27 <b>Co</b> Cobalt 58.933	28 <b>Ni</b> Nickel 58.693	29 <b>Cu</b> Copper 63.546	30 <b>Zn</b> Zinc 65.38	31 <b>Ga</b> Gallium 69.723	32 <b>Ge</b> Germanium 72.631	33 <b>As</b> Arsenic 74.922	34 <b>Se</b> Selenium 78.971	35 <b>Br</b> Bromine 79.904	36 <b>Kr</b> Krypton 83.789

weiter weg  
vom  
Atomkern

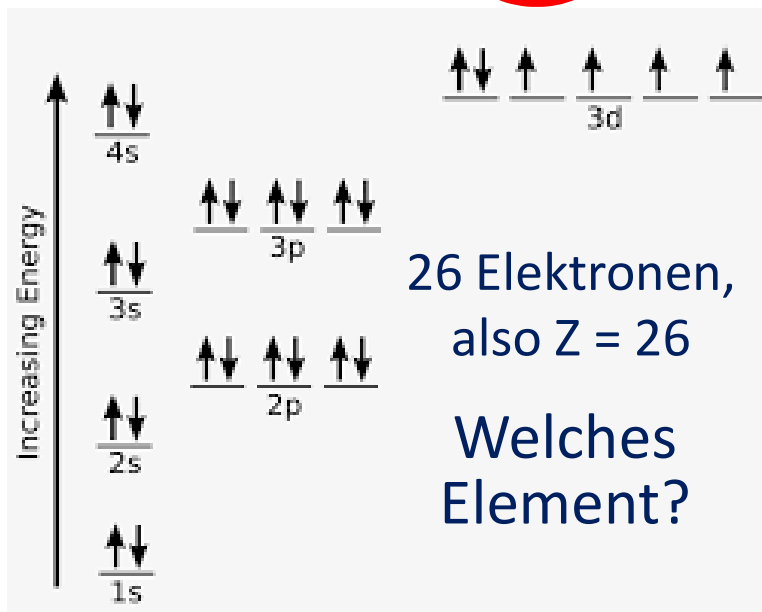
kernnah



1 H Hydrogen 1.008																	13 III A 3 A	14 IV A 4 A	15 V A 5 A	16 VI A 6 A	17 VII A 7 A	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180					
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 III B 3 B	4 IV B 4 B	5 V B 5 B	6 VI B 6 B	7 VII B 7 B	8 VIII 8	9 VIII 8	10 VIII 8	11 IB 1 B	12 IIB 2 B	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948					
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weiter weg  
vom  
Atomkern

kernnah



**ZIEL: Bestimmung der  
Elektronenkonfiguration  
von Eisen!**  
Dazu brauchen wir  
ein wenig Atomphysik...

## Ansatz

Um etwas über Elektronen in Atomen zu lernen muss man sie irgendwie „abfragen = ansprechen“.  
Dazu kann man gut Licht nehmen:  
Atom-Spektroskopie (UV/Vis).

Licht ist eine elektromagnetische Welle.  
Elektromagnetisch bedeutet, dass sowohl elektrische als auch magnetische Felder beteiligt sind.

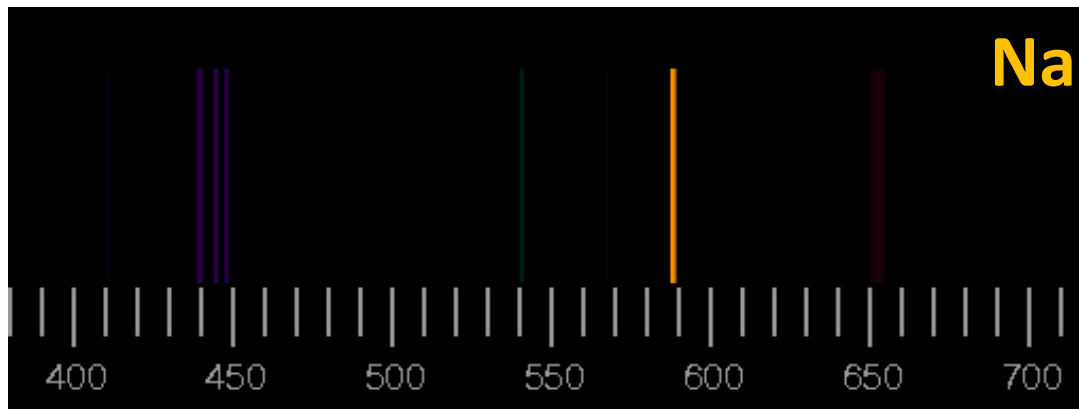
Da Elektronen (Ladung!) auf elektrische Felder (Ladungen!) reagieren kann man also mit Licht (= elektromagnetische Strahlung) etwas über Elektronen in Atomen (und auch Molekülen) lernen.

# 0. Spektroskopie = Wechselwirkung von Licht mit Materie

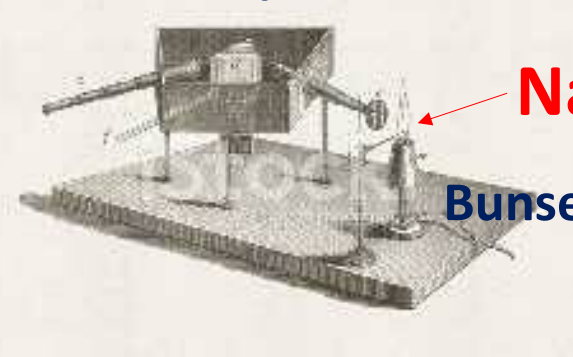
Exp.:

## Nachweis von Alkalimetallen über Flammenfärbung (Li: rot, Na: gelb, K: violett)

Spektral-Analyse (1859)  
Bunsen und Kirchhoff  
Atom-Emissions-Spektroskopie



Prismen-Spektrometer (Lichtzerlegung)



NaCl in Flamme

Bunsenbrenner

**Wie sieht das Atom-Emissions-Spektrum von Wasserstoff (H) als einfachstem Element aus?**

**Beob.:**

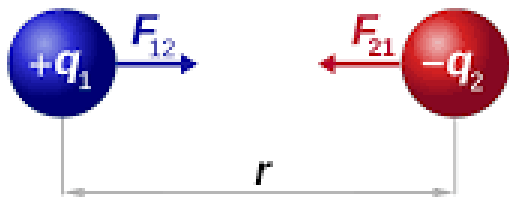


**Diskrete Linien im Atom-Emissions-Spektrum von Wasserstoff (und auch im Absorptionsspektrum).  
Erst mal nicht so verwunderlich, oder?  
War ja bei Li, Na und K auch so...  
Aber wie kann man das Auftreten und die Position der Linien überhaupt erklären?**

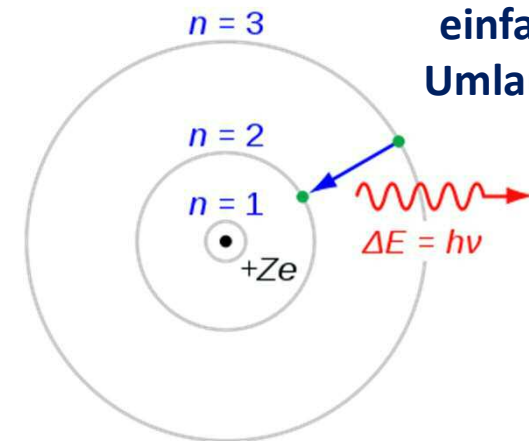


# 0. Spektroskopie = Wechselwirkung von Licht mit Materie

## Erklärung



**Klassische Elektrodynamik:**  
Aufgrund der elektrostatischen Anziehung durch den Kern (Coulomb-Gesetz) müsste das Elektron eigentlich spiralförmig in den Atomkern stürzen. Tut es aber nicht. Es ist stabil.  
Dilemma = Erklärungsnotstand!

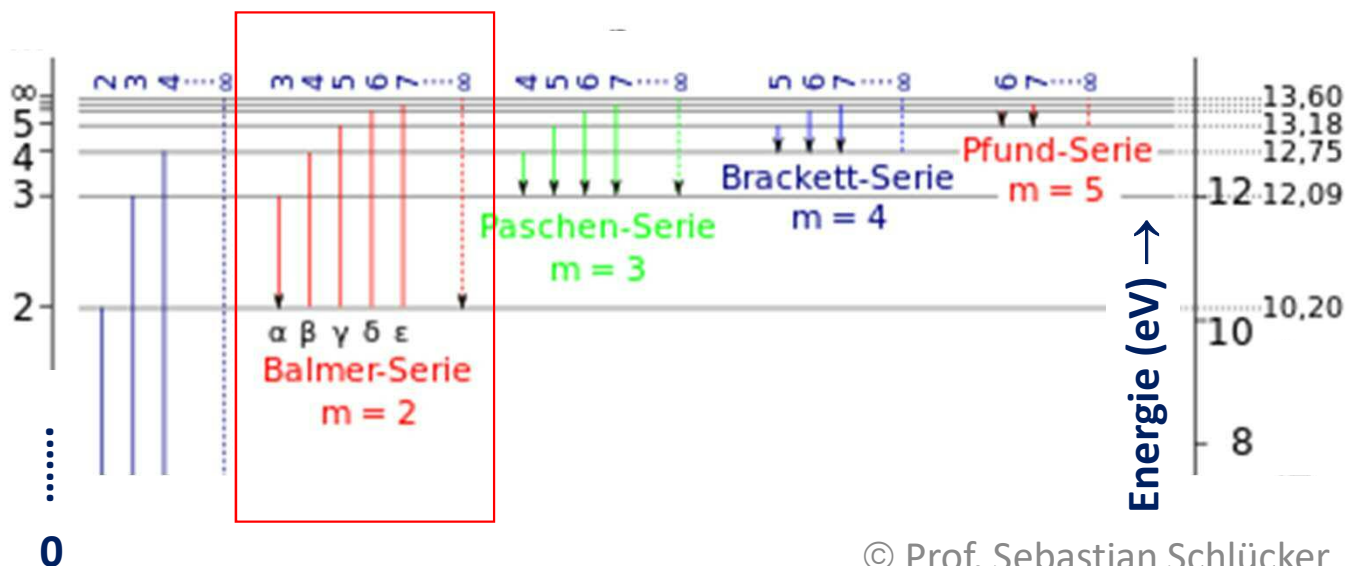


Der Ausweg:  
Bohr postuliert einfach stabile Umlaufbahnen.

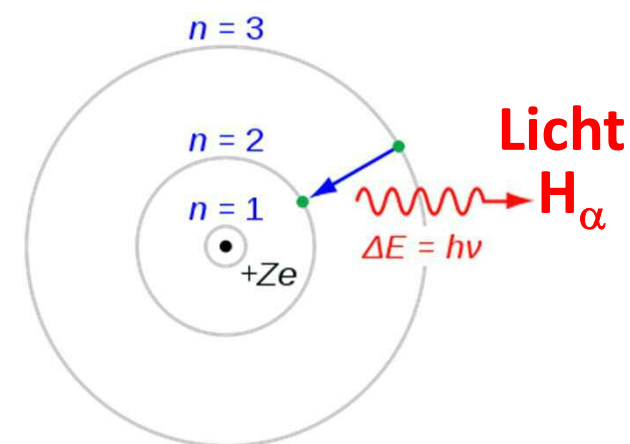
# 0. Spektroskopie und Quantenzahlen

## Erklärung

### Balmer-Serie



Haupt-Quantenzahl n  
(„Schale“ = Abstand vom Kern)



## 0. Quantenzahlen

Insgesamt gibt es 4 Quantenzahlen (QZ).

Die **Haupt-QZ (n)** und die **Neben-QZ (l)** beschreiben zusammen die Art des Energieniveaus (im Bohr-Sommerfeld-Modell die „Unterschale“ oder „Bahn“; quantenmechanisch: das Atomorbital = Einelektronenwellenfunktion).

Die **Magnet-QZ (m)** beschreibt die Unterscheidung = Energieaufspaltung zwischen ansonsten energiegelichen („entarteten“) Energieniveaus beim Anlegen externer magnetischer und elektrischer Felder.

Die **Spin-QZ (s)** kann man im Gegensatz zur den ersten drei QZ nicht mit klassischen Modellen verstehen – sie ist eine rein quantenmechanische Größe.

# 0. Quantenzahlen

“Vier gewinnt”: aus welchen Exp. wurde die 4 QZ abgeleitet?

## Exp./Beob.:

## Erklärung

**Haupt-QZ**  $n$

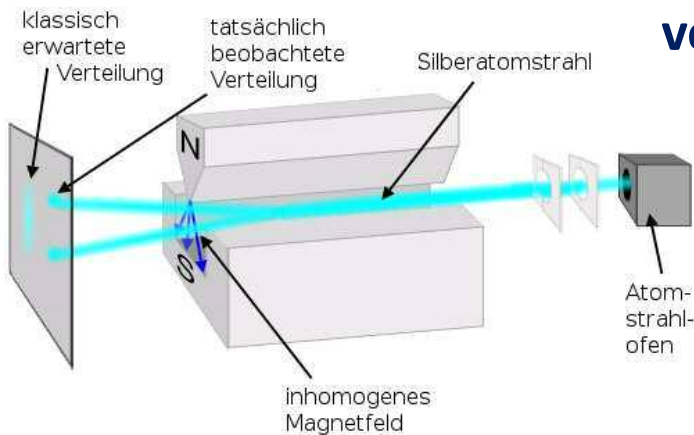
**Neben-QZ**  $l$

**Magnet-QZ**  $m$

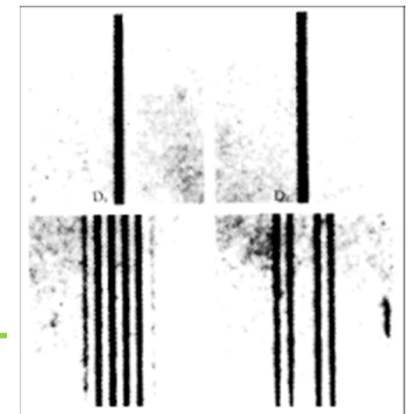
**Spin-QZ**  $s$

H-Atom-Emissions-Spektrum: Linien  
Feinaufspaltung H-Spektral-Linien  
Zeemann-Effekt = Aufspaltung von  
Spektral-Linien im Magnetfeld  
Stern-Gerlach-Exp. (1921): Ablenkung  
von Ag-Atomen im inhom. Magnetfeld

Bohr: Kreisbahn  
Sommerfeld: Ellipsen  
magnetisches Moment  
von Elektronen  
Elektronen-Spin



Ohne  
vs.  
Mit  
Magnet-  
Feld

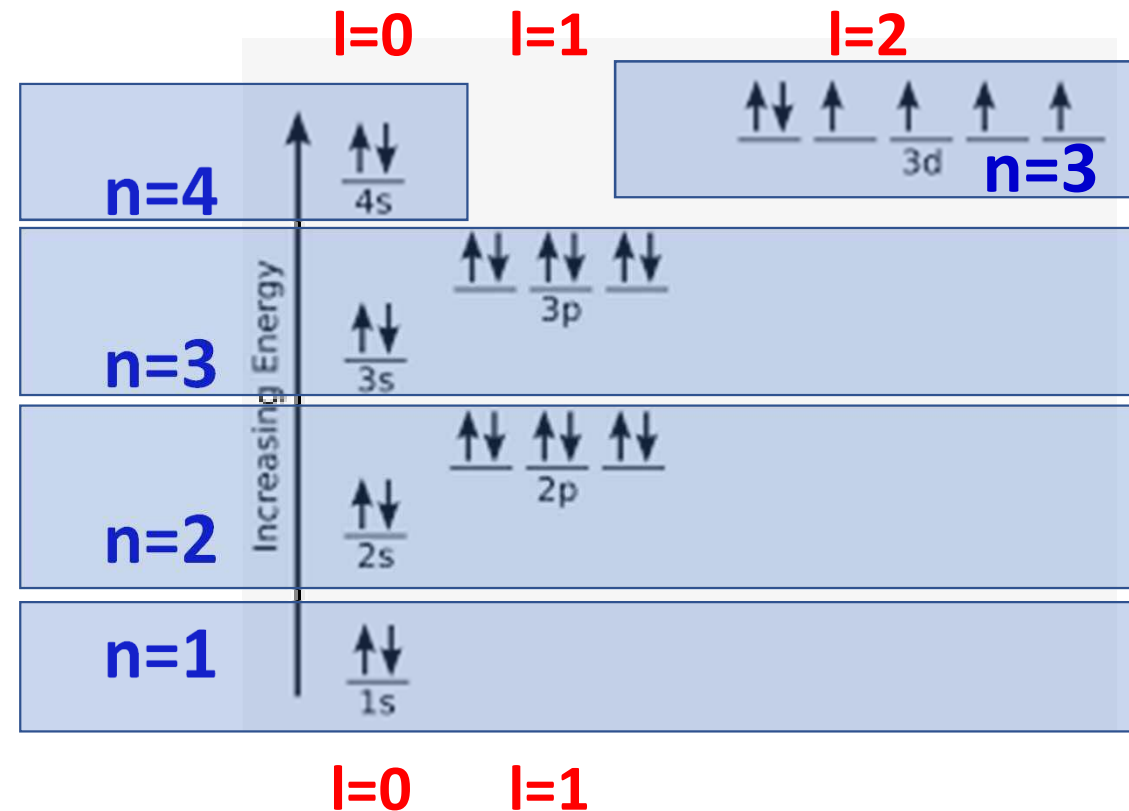


# 0. Was ist die Elektronenkonfiguration?

## 4 QZ: welche Zahlenwerte können sie annehmen?

**Haupt-QZ** **Neben-QZ ( $l=0,1, \dots, n-1$ )**

Haupt-QZ	$l=0$	$l=1$	$l=2$	$l=3$
$n=1$	<del>1s</del>			
$n=2$	<del>2s</del>	<del>2p</del>		
$n=3$	<del>3s</del>	<del>3p</del>	<del>3d</del>	
$n=4$	<del>4s</del>	<del>4p</del>	<del>4d</del>	<del>4f</del>
$n=5$	<del>5s</del>	<del>5p</del>	<del>5d</del>	<del>5f</del>
$n=6$	<del>6s</del>	<del>6p</del>	<del>6d</del>	



# 0. Was ist die Elektronenkonfiguration?

## 4 QZ: welche Zahlenwerte können sie annehmen?

Magnet-QZ ( $2l+1$  Werte)

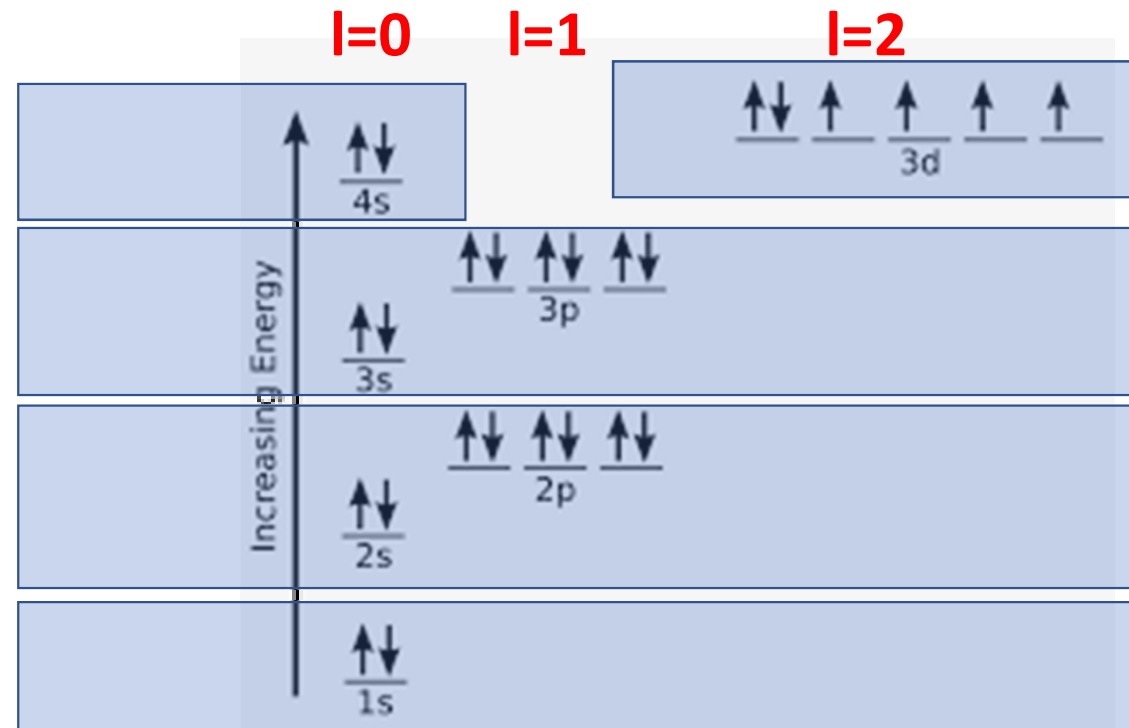
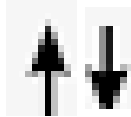
$m = -l, -l+1, \dots, 0, \dots, l-1, l$

$l=0$  (s-Orbital) = 1x ( $m=0$ )

$l=1$  (p-Orbital) = 3x ( $m=-1, 0, +1$ )

$l=2$  (d-Orbital) = 5x ( $m=-2, -1, 0, +1, +2$ )

Spin-QZ  $s = \pm 1/2$



# 1. Wie bestimmt man die Elektronenkonfiguration?

## Regeln

## MERKE!

Ad 1.



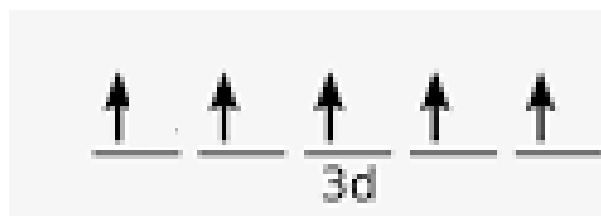
**Aufbauprinzip** zum Auffüllen der Schalen:

1. Besetzung mit Elektronen nach steigender Energie
2. Maximal zwei Elektronen pro Orbital (Pauli-Verbot)
3. Energiegleiche Orbitale werden erst einzeln mit gleicher Spinquantenzahl besetzt (Hundsche Regel der maximalen Multiplizität = maximalem Spin)

Ad 2.

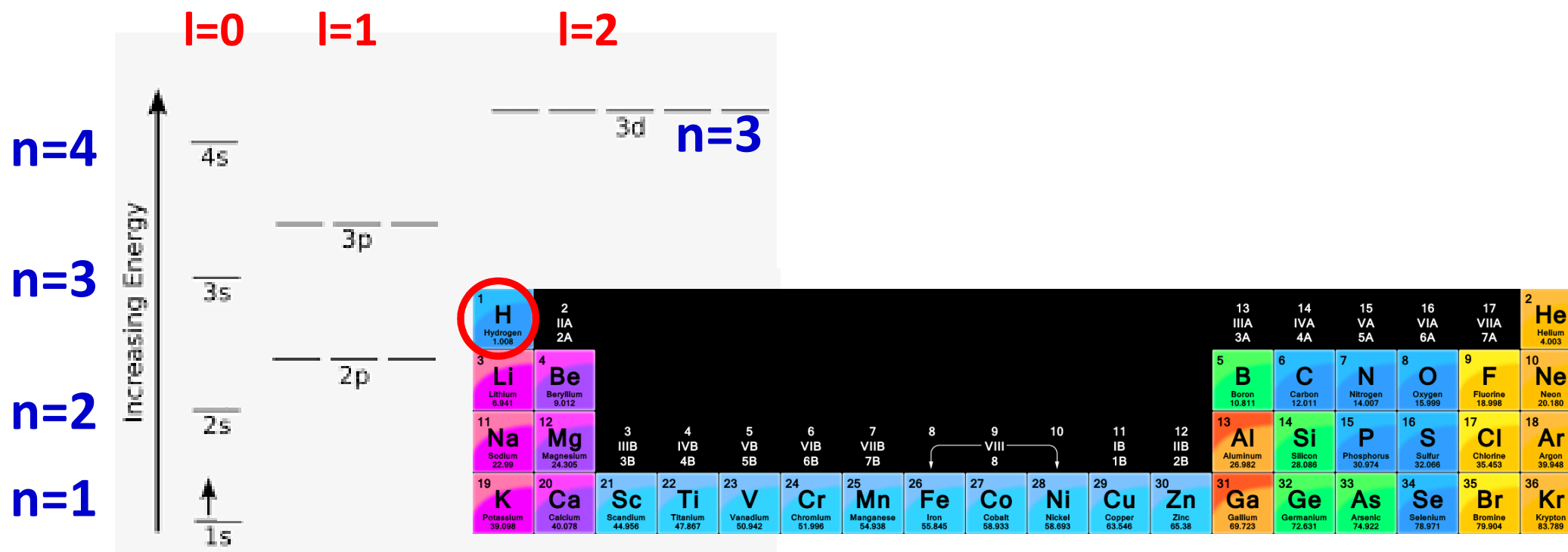


Ad 3.



# 1. Wie bestimmt man die Elektronenkonfiguration?

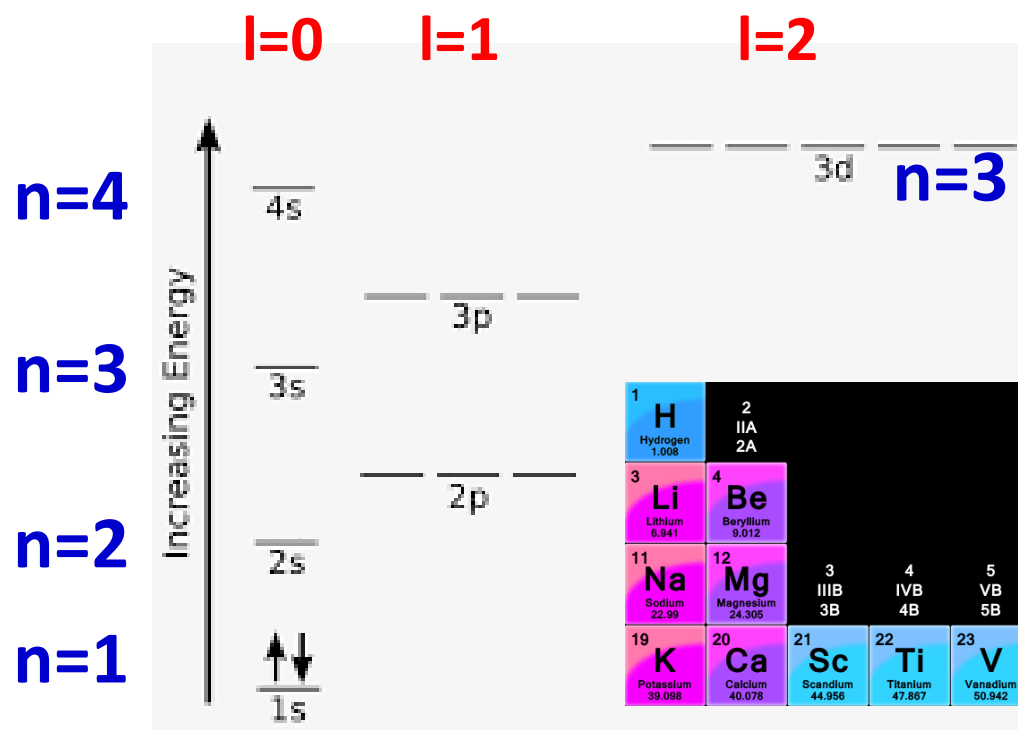
## Elektronenkonfiguration Wasserstoff: $1s^1$





# 1. Wie bestimmt man die Elektronenkonfiguration?

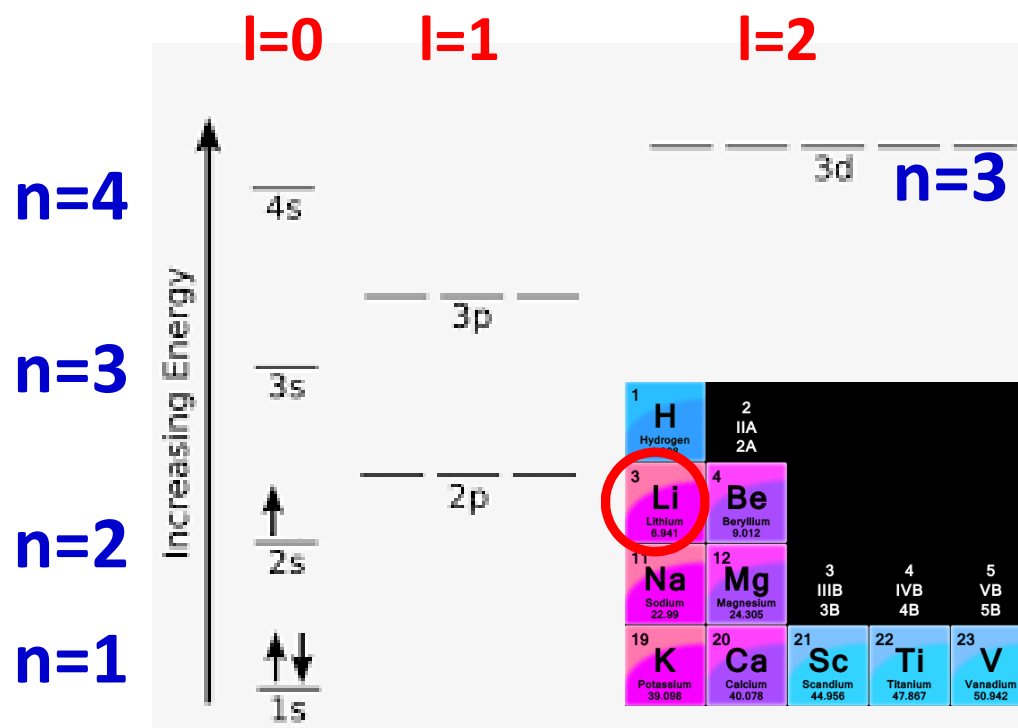
Elektronenkonfiguration Helium:  
 $1s^2$



1 H Hydrogen 1.008	2 IIA Be 9.012											13 IIIA B 10.811	14 IVA C 12.011	15 VA N 14.007	16 VIA O 15.999	17 VIIA F 18.998	18 Ne 20.180
3 Li Lithium 6.941	4 Be Beryllium 9.012	3 IIIB Sc 44.956	4 IVB Ti 47.867	5 VB V 50.942	6 VIB Cr 51.996	7 VIIB Mn 54.938	8 VIII Fe 55.845	9 VIII Co 58.933	10 VIII Ni 58.693	11 IB Cu 63.546	12 IIB Zn 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789

# 1. Wie bestimmt man die Elektronenkonfiguration?

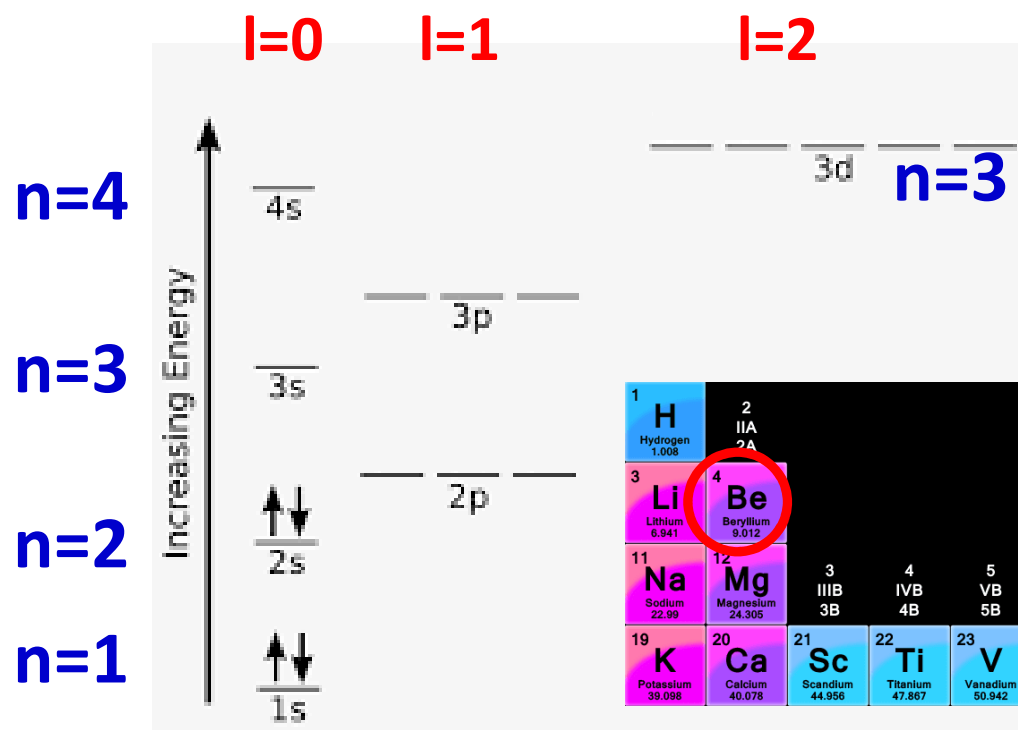
Elektronenkonfiguration Lithium:  
 $1s^2 2s^1$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A Al Aluminum 26.982	14 IVA 4A Si Silicon 28.086	15 VA 5A P Phosphorus 30.974	16 VIA 6A S Sulfur 32.066	17 VIIA 7A Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.003	
3 Li Lithium 6.941	4 Mg Magnesium 24.305	11 Na Sodium 22.99	12 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789

# 1. Wie bestimmt man die Elektronenkonfiguration?

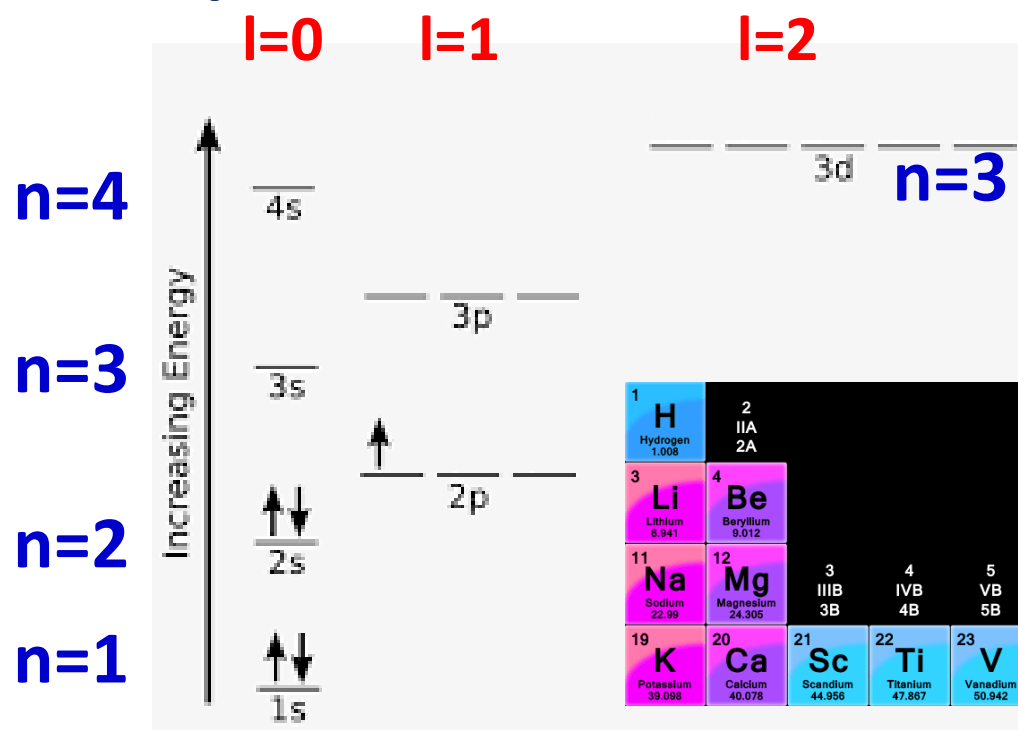
## Elektronenkonfiguration Beryllium: $1s^2 2s^2$



1 H Hydrogen 1.008	2 IIA Li Lithium 6.941	3 Li Lithium 6.941	4 Be Beryllium 9.012								13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.003
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789

# 1. Wie bestimmt man die Elektronenkonfiguration?

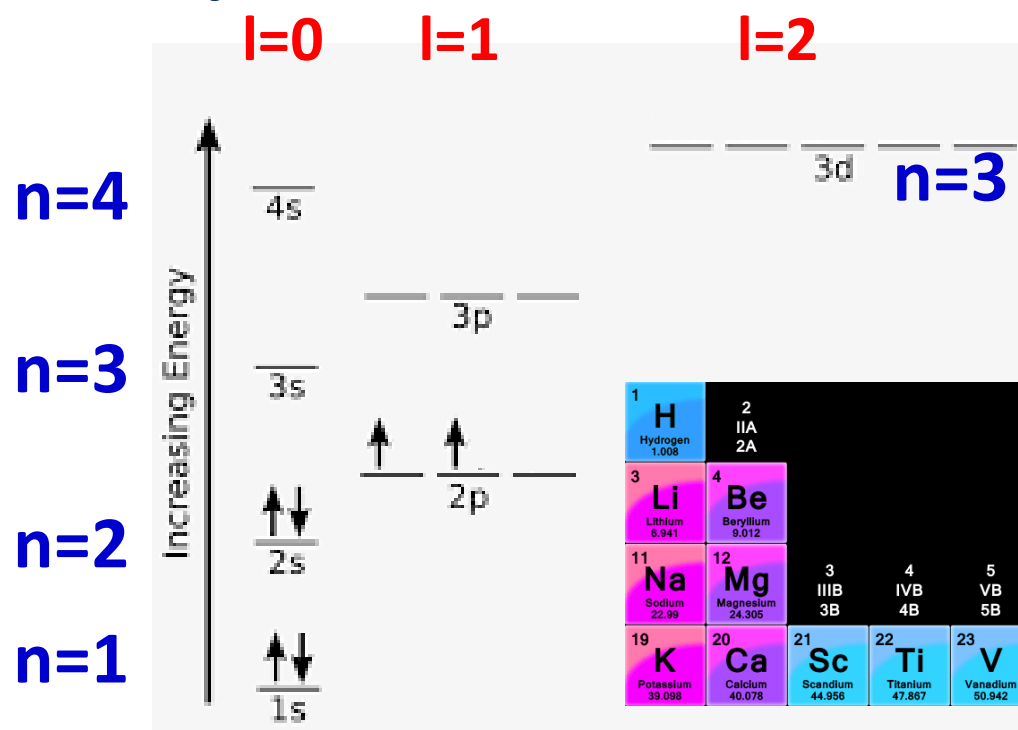
Elektronenkonfiguration Bor:  
 $1s^2 2s^2 2p^1$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012	3 Li Lithium 6.941	4 Be Beryllium 9.012	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	11 Na Sodium 22.99	12 Mg Magnesium 24.305	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.36	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.6	53 I Iodine 126.91	54 Xe Xenon 131.29	55 Ba Barium 137.33	56 La Lanthanum 138.91	57 Ce Cerium 140.12	58 Pr Praseodymium 140.91	59 Nd Neodymium 144.24	60 Pm Promethium 145	61 Sm Samarium 150.36	62 Eu Europium 151.96	63 Gd Gadolinium 157.25	64 Tb Terbium 158.93	65 Dy Dysprosium 162.50	66 Ho Holmium 164.93	67 Er Erbium 167.26	68 Tm Thulium 168.93	69 Yb Ytterbium 173.05	70 Lu Lutetium 174.96	71 Hf Hafnium 178.49	72 Ta Tantalum 180.95	73 W Tungsten 183.84	74 Re Rhenium 186.21	75 Os Osmium 190.23	76 Ir Iridium 192.22	77 Pt Platinum 195.08	78 Au Gold 196.97	79 Hg Mercury 200.59	80 Tl Thallium 204.38	81 Pb Lead 207.2	82 Bi Bismuth 208.98	83 Po Polonium 209	84 At Astatine 210	85 Fr Francium 223	86 Ra Radium 226	87 Ac Actinium 227	88 Th Thorium 232.04	89 Pa Protactinium 231.04	90 U Uranium 238.03	91 Np Neptunium 237	92 Pu Plutonium 244	93 Am Americium 243	94 Cm Curium 247	95 Bk Berkelium 247	96 Cf Californium 251	97 Es Einsteinium 252	98 Fm Fermium 257	99 Md Mendelevium 258	100 No Nobelium 259	101 Lr Lawrencium 260
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# 1. Wie bestimmt man die Elektronenkonfiguration?

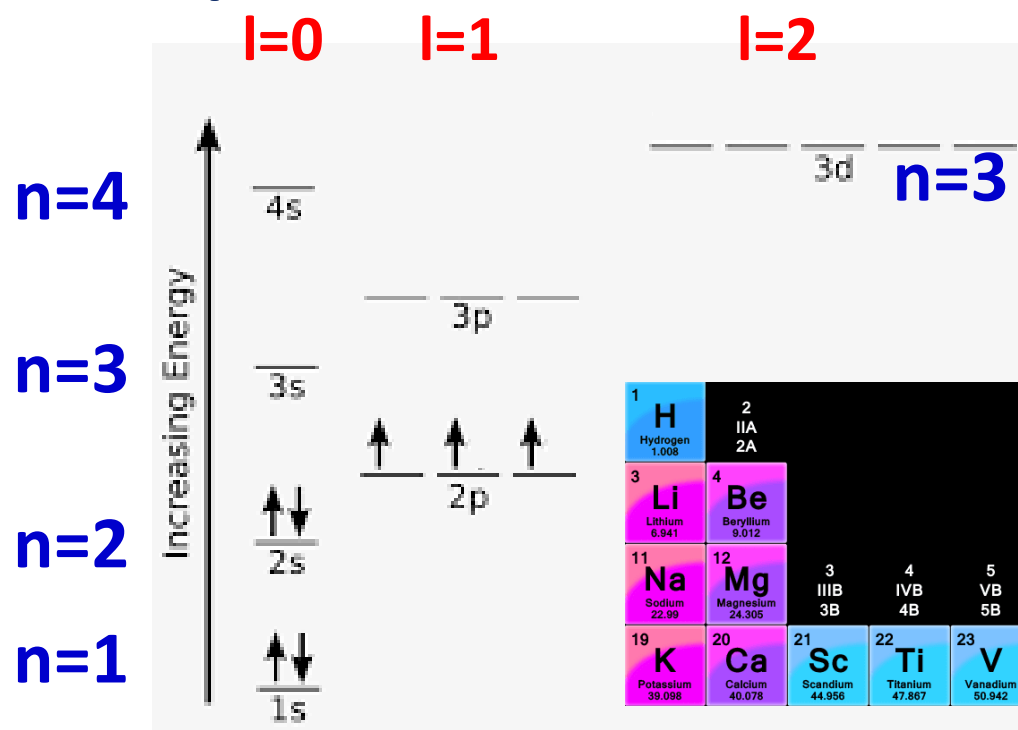
Elektronenkonfiguration Kohlenstoff:  
 $1s^2 2s^2 2p^2$



1 H Hydrogen 1.008	2 IIA Be 9.012											13 III A Al 26.982	14 IVA C 12.011	15 VA N 14.007	16 VIA O 15.999	17 VIIA F 18.998	18 Ne 20.180	2 He 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
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# 1. Wie bestimmt man die Elektronenkonfiguration?

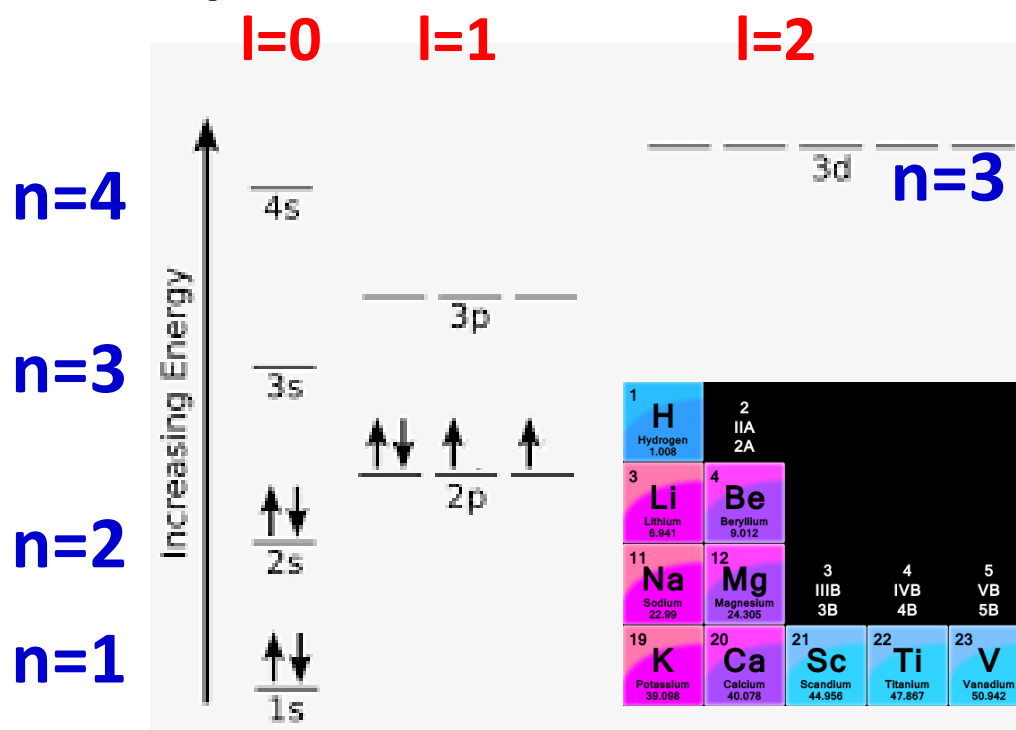
## Elektronenkonfiguration Stickstoff: $1s^2 2s^2 2p^3$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

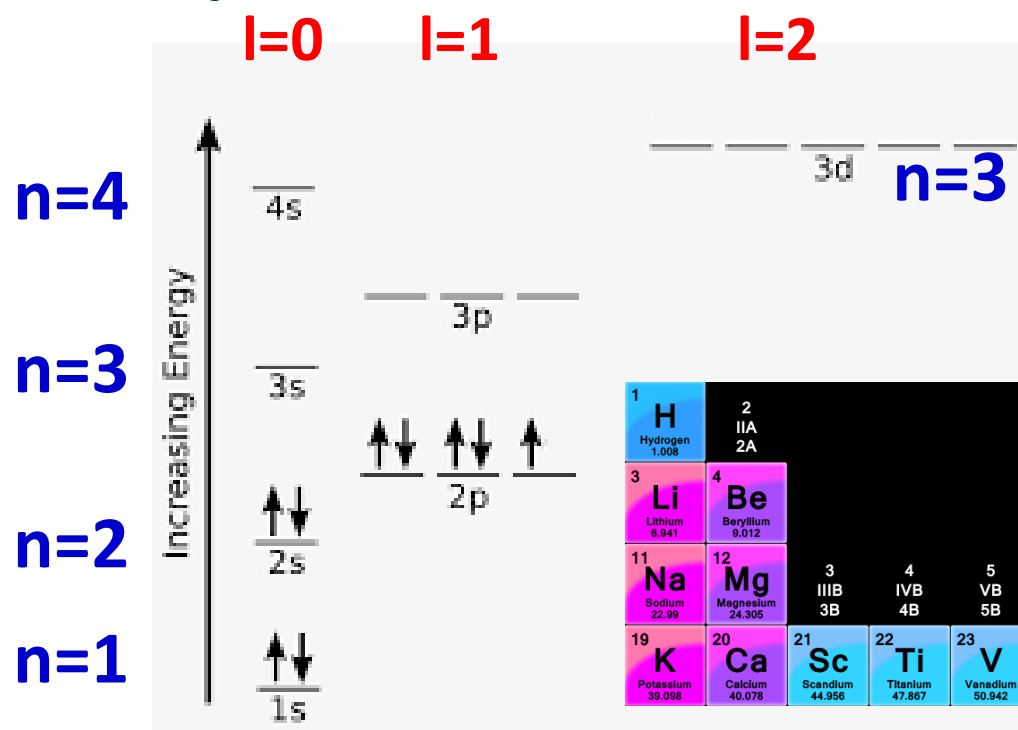
## Elektronenkonfiguration Sauerstoff: $1s^2 2s^2 2p^4$



1 H Hydrogen 1.008	2 IIA Be 9.012											13 IIIA B 10.811	14 IVA C 12.011	15 VA N 14.007	16 VIA O 15.999	17 VIIA F 18.998	18 Ne 20.180	2 He 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc 44.956	4 IVB Ti 47.867	5 VB V 50.942	6 VIB Cr 51.996	7 VIIB Mn 54.938	8 VIII Fe 55.845	9 VIII Co 58.933	10 VIII Ni 58.693	11 IB Cu 63.546	12 IIB Zn 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

Elektronenkonfiguration Fluor:  
 $1s^2 2s^2 2p^5$

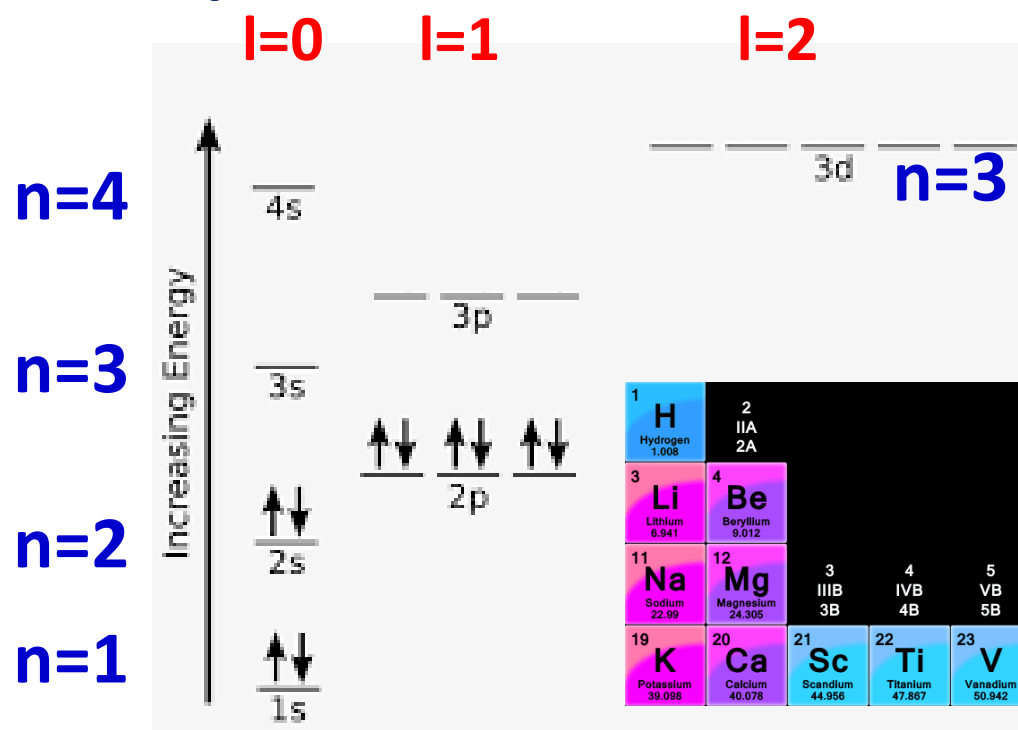


1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA B Boron 10.811	14 IVA C Carbon 12.011	15 VA N Nitrogen 14.007	16 VIA O Oxygen 15.999	17 VIIA F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948		
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789		



# 1. Wie bestimmt man die Elektronenkonfiguration?

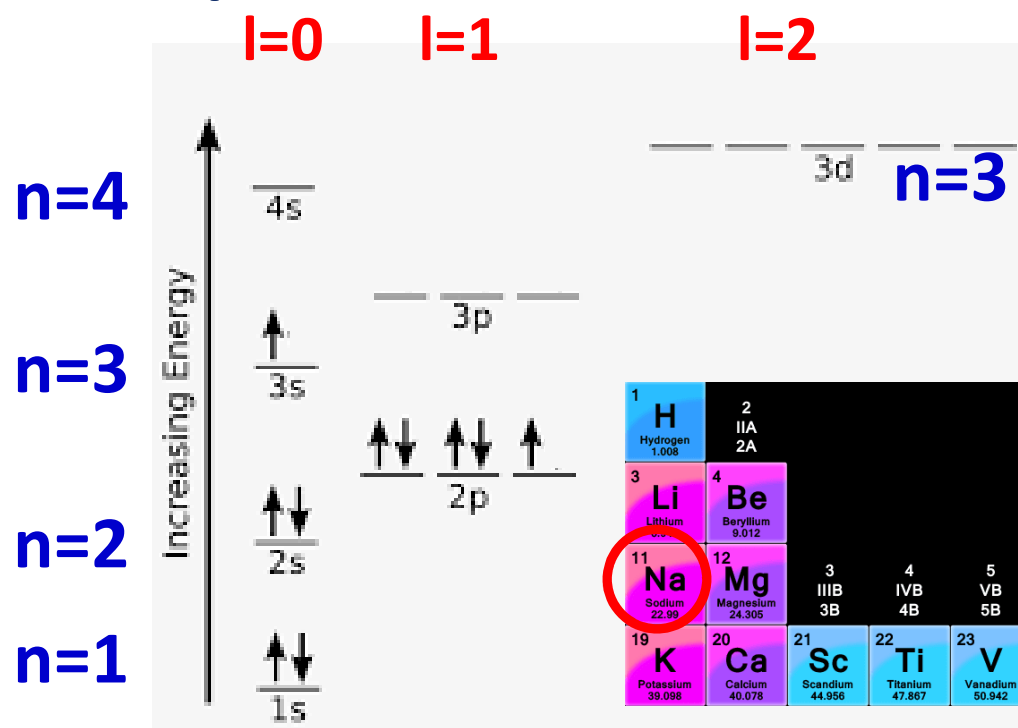
Elektronenkonfiguration Neon:  
 $1s^2 2s^2 2p^6$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.0026
3 Li Lithium 6.941	4 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

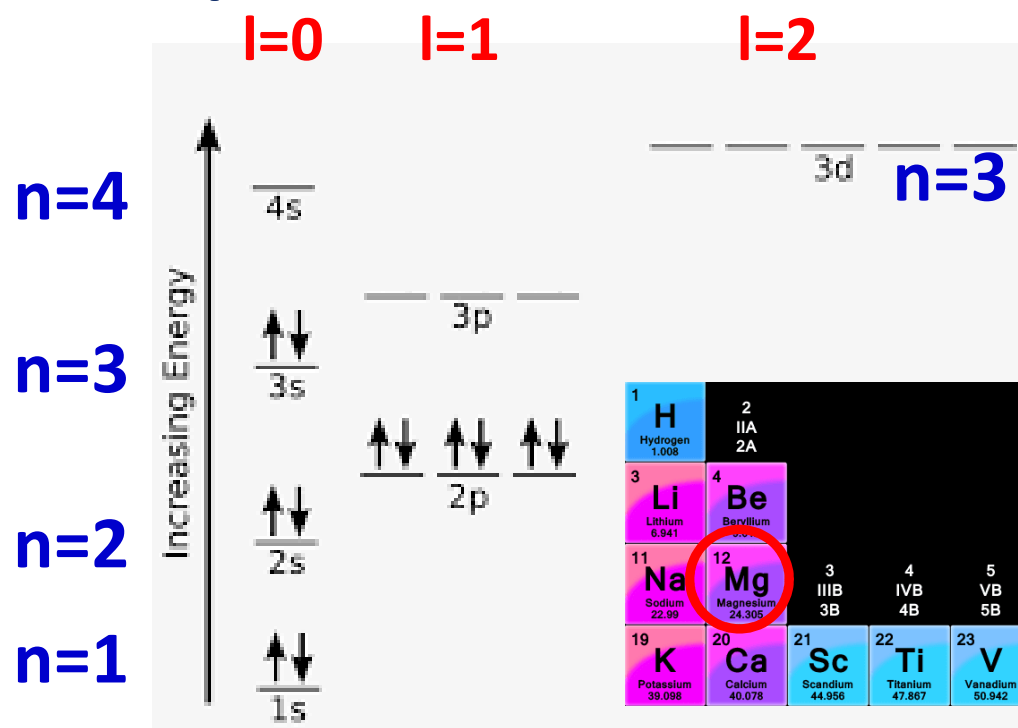
Elektronenkonfiguration Natrium:  
 $1s^2 2s^2 2p^6 3s^1$



1 H Hydrogen 1.008	2 IIA 2A											13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Natrium 22.99	12 Mg Magnesium 24.305	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8 VIII 8	9 VIII 8	10 VIII 8	11 IB 1B	12 IIB 2B	13 Al Aluminium 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Kalium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chrom 51.996	25 Mn Mangan 54.938	26 Fe Eisen 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Kupfer 63.546	30 Zn Zink 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsen 74.922	34 Se Selen 78.971	35 Br Brom 79.904	36 Kr Krypton 83.789

# 1. Wie bestimmt man die Elektronenkonfiguration?

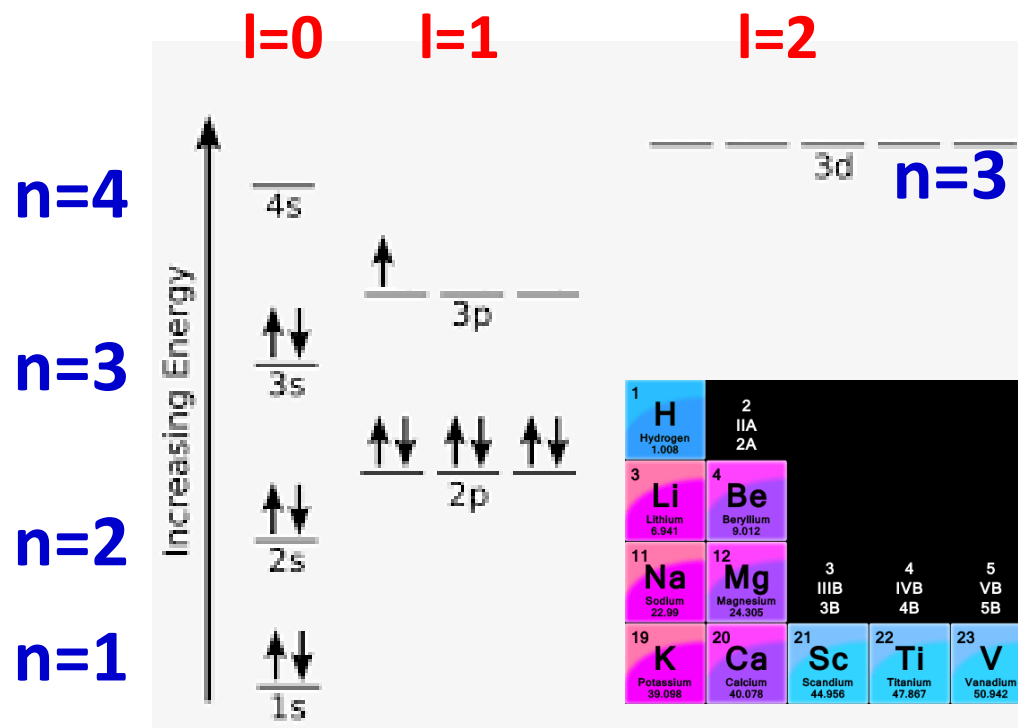
Elektronenkonfiguration Magnesium:  
 $1s^2 2s^2 2p^6 3s^2$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012	3 Li Lithium 6.941	4 B Boron 10.811	5 C Carbon 12.011	6 N Nitrogen 14.007	7 O Oxygen 15.999	8 F Fluorine 18.998	9 Ne Neon 20.180	10 Na Sodium 22.99	11 Mg Magnesium 24.305	12 Al Aluminum 26.982	13 Si Silicon 28.086	14 P Phosphorus 30.974	15 S Sulfur 32.066	16 Cl Chlorine 35.453	17 Ar Argon 39.948	18 K Potassium 39.098	19 Ca Calcium 40.078	20 Sc Scandium 44.956	21 Ti Titanium 47.867	22 V Vanadium 50.942	23 Cr Chromium 51.996	24 Mn Manganese 54.938	25 Fe Iron 55.845	26 Co Cobalt 58.933	27 Ni Nickel 58.693	28 Cu Copper 63.546	29 Zn Zinc 65.38	30 Ga Gallium 69.723	31 Ge Germanium 72.631	32 As Arsenic 74.922	33 Se Selenium 78.971	34 Br Bromine 79.904	35 Kr Krypton 83.789	36 He Helium 4.003
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# 1. Wie bestimmt man die Elektronenkonfiguration?

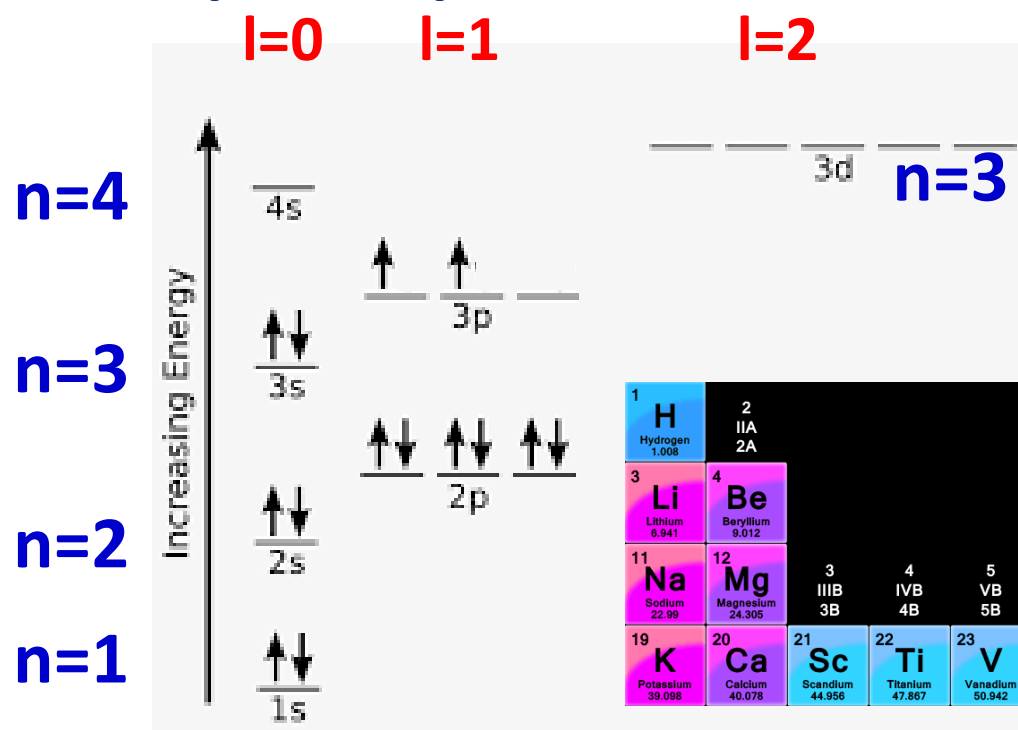
Elektronenkonfiguration Aluminium:  
 $1s^2 2s^2 2p^6 3s^2 3p^1$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA B Boron 10.81	14 IVA C Carbon 12.011	15 VA N Nitrogen 14.007	16 VIA O Oxygen 15.999	17 VIIA F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948		
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789		

# 1. Wie bestimmt man die Elektronenkonfiguration?

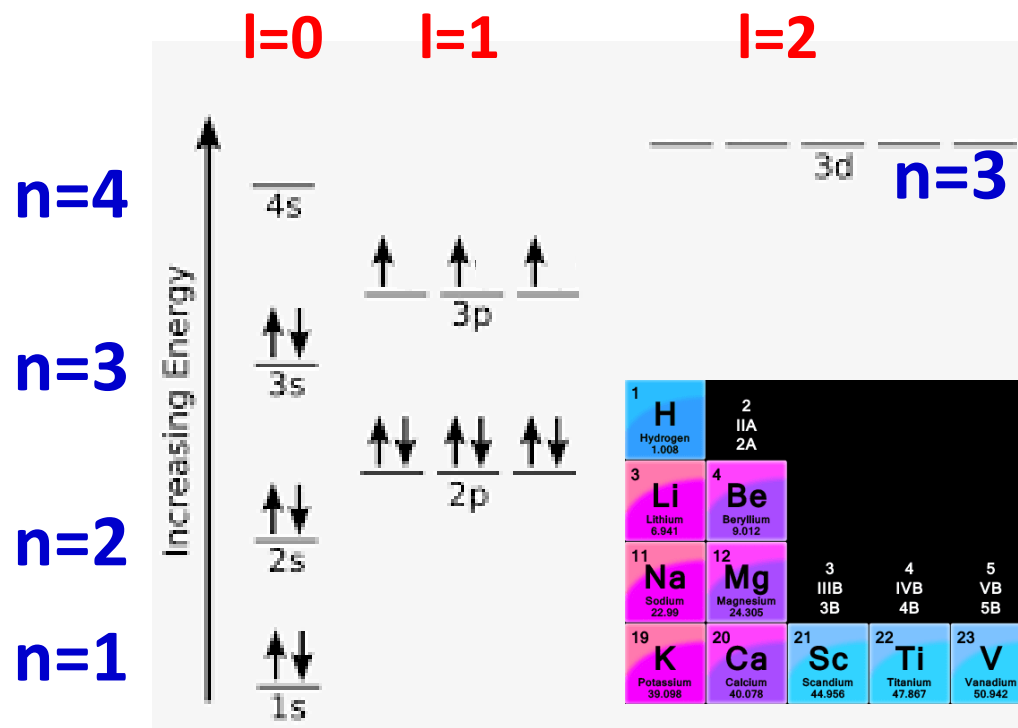
Elektronenkonfiguration Silizium:  
 $1s^2 2s^2 2p^6 3s^2 3p^2$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA C Carbon 12.011	15 VA N Nitrogen 14.007	16 VIA O Oxygen 15.999	17 VIIA F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

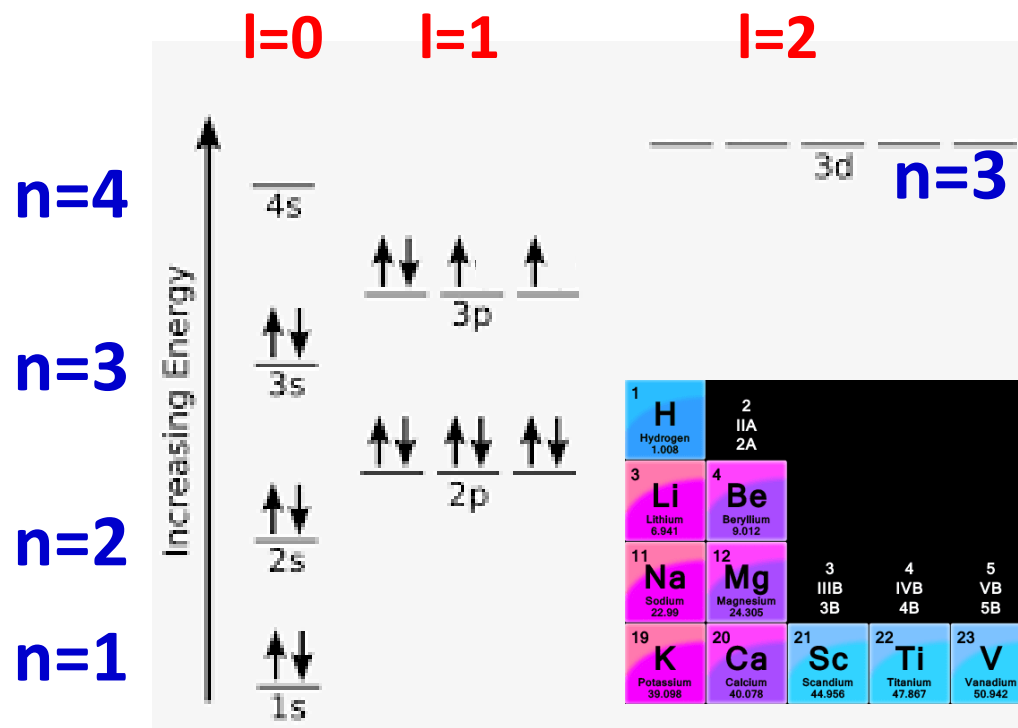
Elektronenkonfiguration Phosphor:  
 $1s^2 2s^2 2p^6 3s^2 3p^3$



1 H Hydrogen 1.008	2 IIA Be 9.012											13 IIIA B 10.811	14 IVA C 12.011	15 VA N 14.007	16 VIA O 15.999	17 VIIA F 18.998	18 Ne 20.180	2 He 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc 44.956	4 IVB Ti 47.867	5 VB V 50.942	6 VIB Cr 51.996	7 VIIB Mn 54.938	8 Fe Iron 55.845	9 VIII Co 58.933	10 VIII Ni 58.693	11 IB Cu 63.546	12 IIB Zn 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

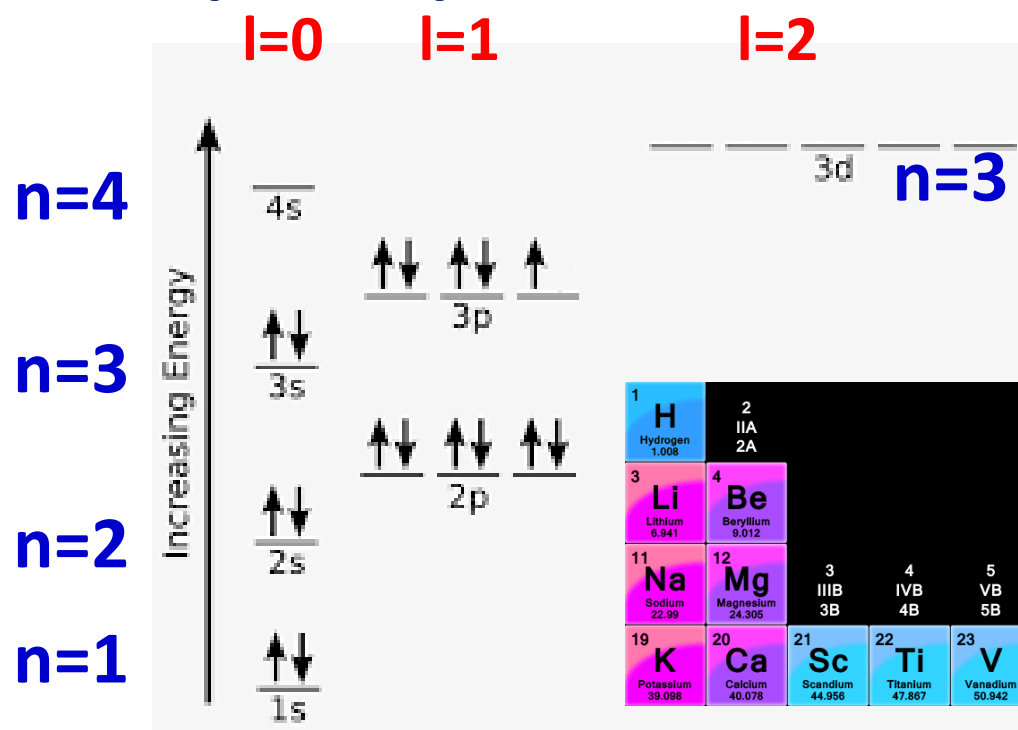
Elektronenkonfiguration Schwefel:  
 $1s^2 2s^2 2p^6 3s^2 3p^4$



1 H Hydrogen 1.008	2 IIA Be 9.012											13 IIIA B 10.811	14 IVA C 12.011	15 VA N 14.007	16 VIA O 15.999	17 VIIA F 18.998	18 Ne 20.180	2 He 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Natrium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc 44.956	4 IVB Ti 47.867	5 VB V 50.942	6 VIB Cr 51.996	7 VIIB Mn 54.938	8 VIII Fe 55.845	9 VIII Co 58.933	10 VIII Ni 58.693	11 IB Cu 63.546	12 IIB Zn 65.38	13 Al Aluminium 26.982	14 Si Silicon 28.086	15 P Phosphor 30.974	16 S Schwefel 32.066	17 Cl Chlor 35.453	18 Ar Argon 39.948	
19 K Kalium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chrom 51.996	25 Mn Mangan 54.938	26 Fe Eisen 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Kupfer 63.546	30 Zn Zink 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsen 74.922	34 Se Selen 78.971	35 Br Brom 79.904	36 Kr Krypton 83.799	

# 1. Wie bestimmt man die Elektronenkonfiguration?

Elektronenkonfiguration Chlor:  
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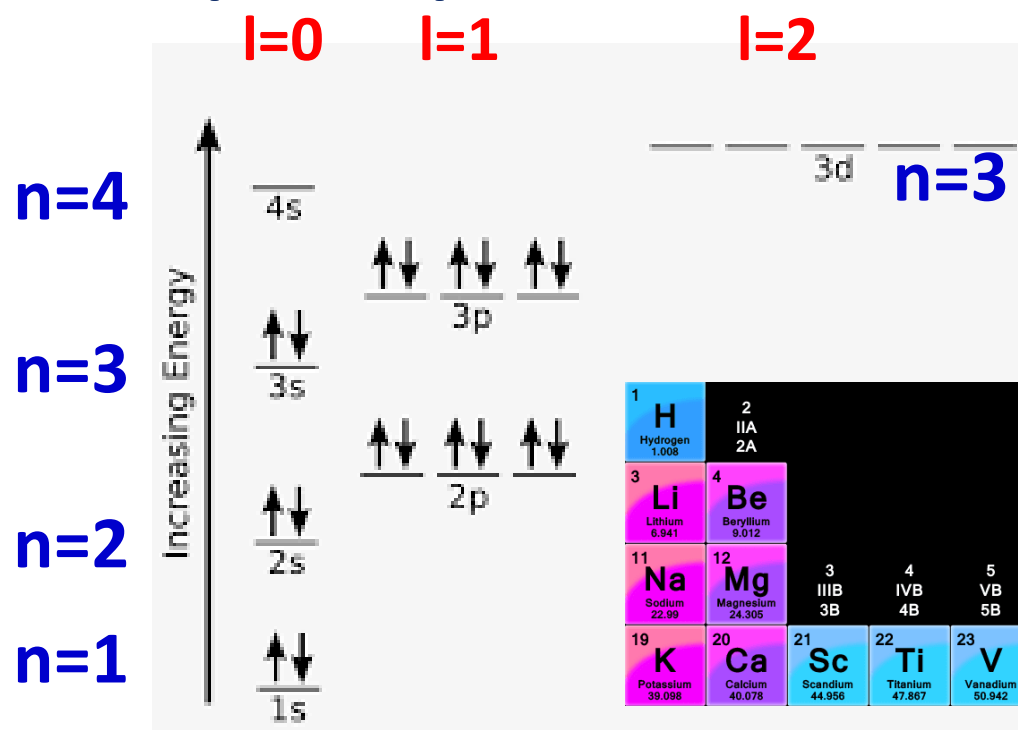


1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 VIII Ar Argon 39.948	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Natrium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Mangan 54.938	8 VIII Fe Eisen 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Kupfer 63.546	12 IIB Zn Zink 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Kalium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Mangan 54.938	26 Fe Eisen 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Kupfer 63.546	30 Zn Zink 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsen 74.922	34 Se Selen 78.971	35 Br Brom 79.904	36 Kr Krypton 83.789	



# 1. Wie bestimmt man die Elektronenkonfiguration?

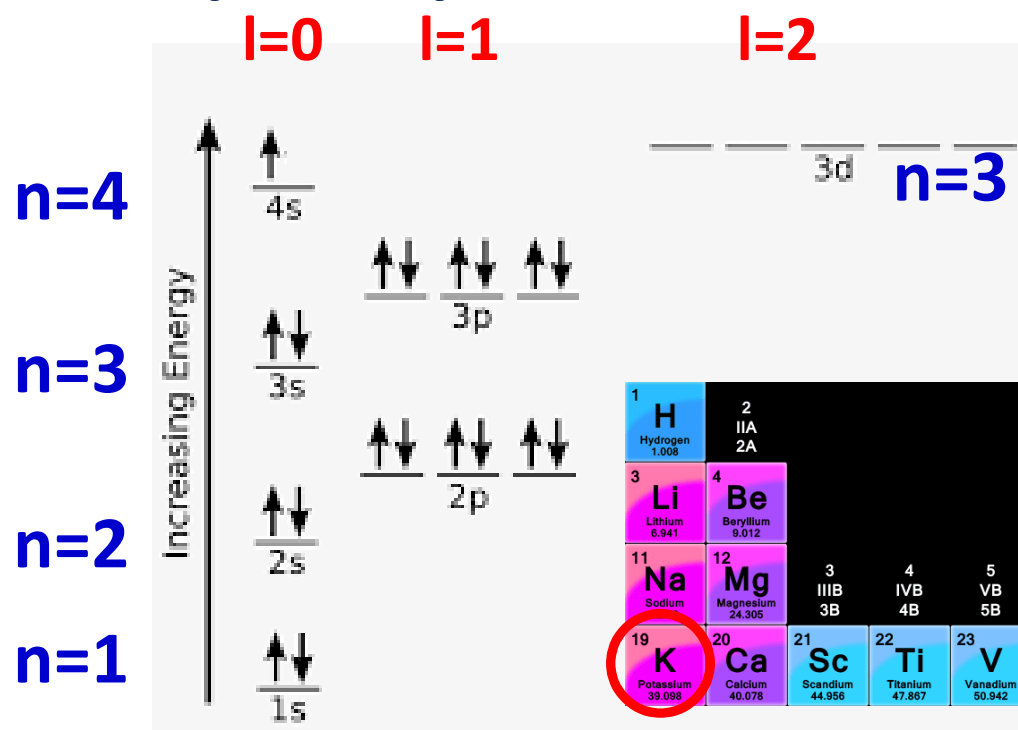
Elektronenkonfiguration Argon:  
 $1s^2 2s^2 2p^6 3s^2 3p^6$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 VIII Ar Argon 39.948	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	19 K Potassium 39.098	20 Ca Calcium 40.078
												5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		

# 1. Wie bestimmt man die Elektronenkonfiguration?

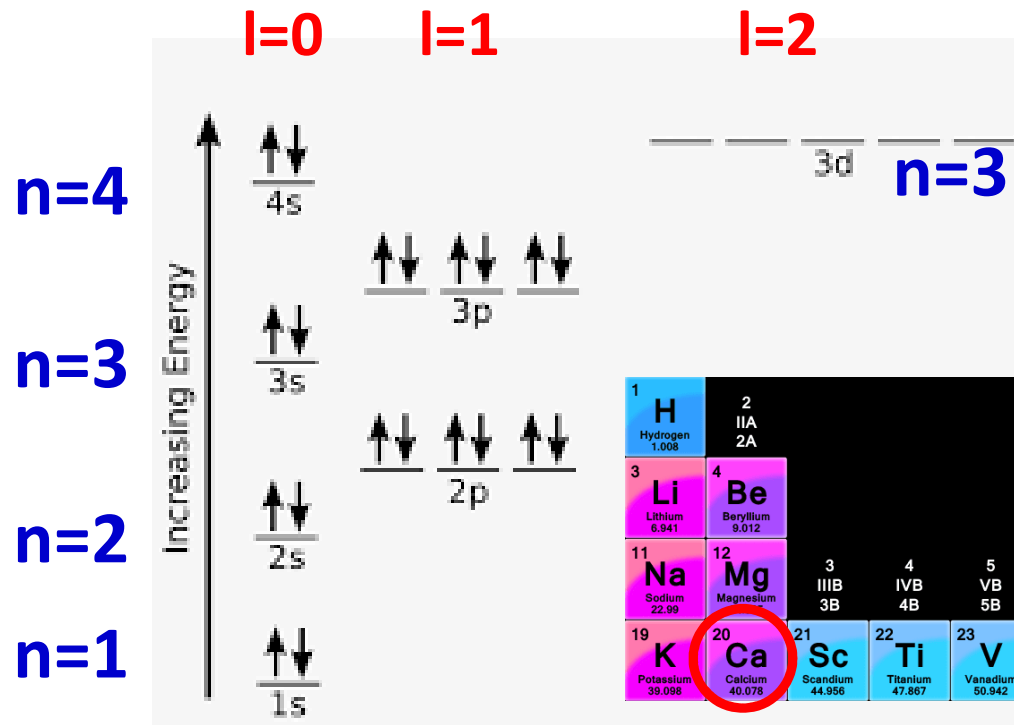
Elektronenkonfiguration Kalium:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012	13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 VIIIA 8A Ne Neon 20.180	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789
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# 1. Wie bestimmt man die Elektronenkonfiguration?

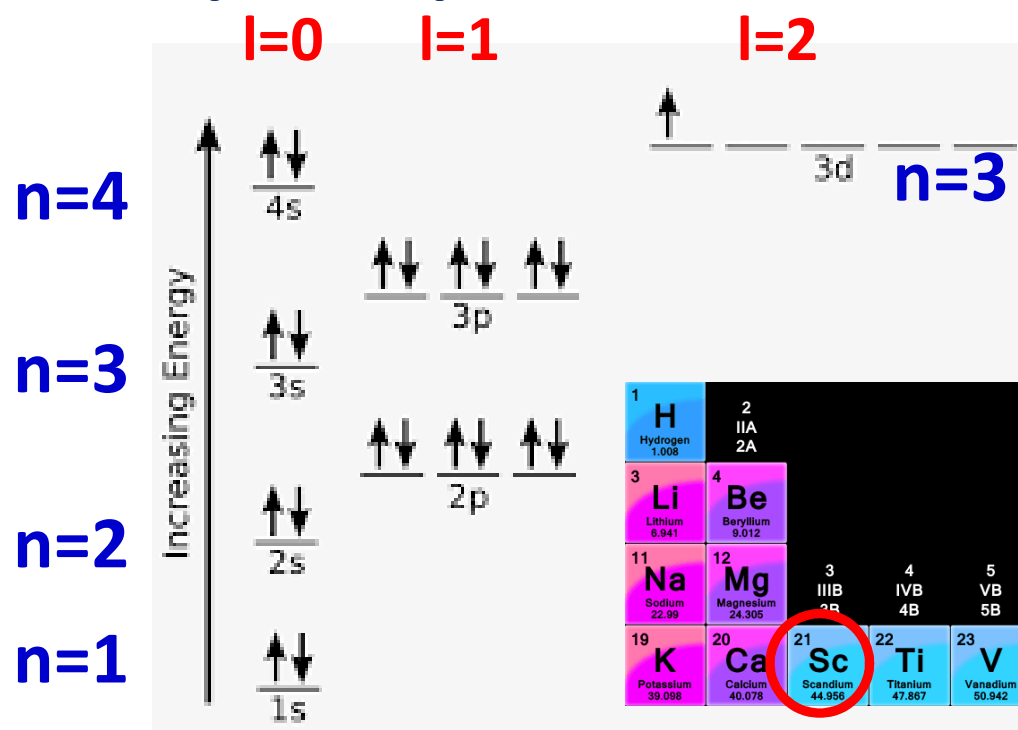
Elektronenkonfiguration Calcium:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 VIII Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

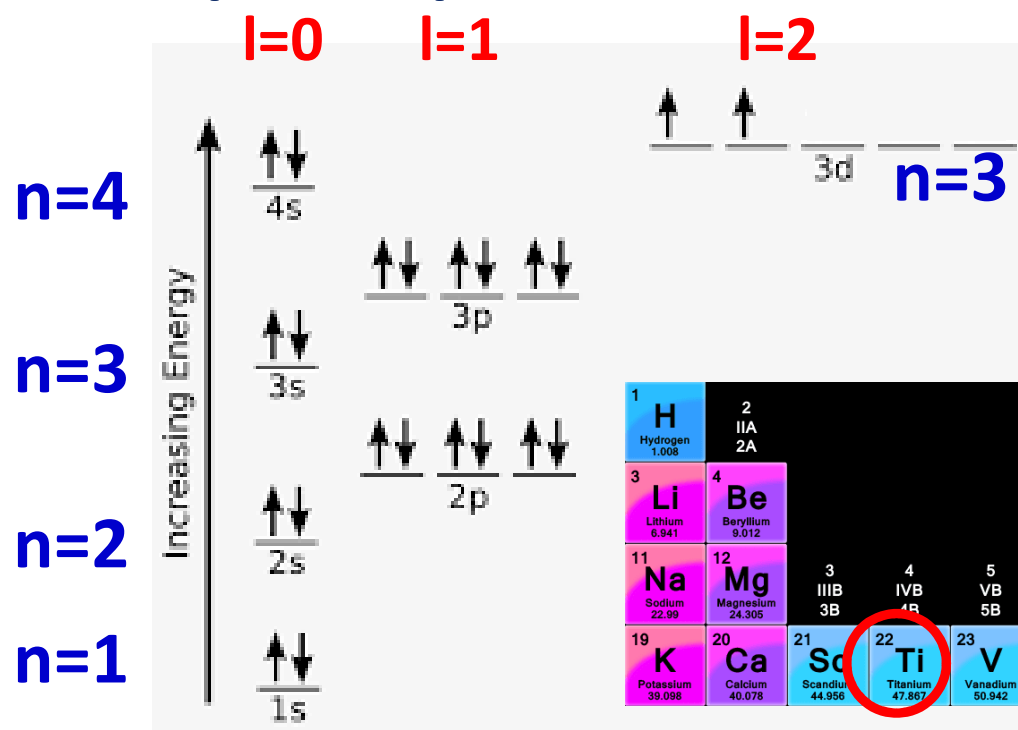
Elektronenkonfiguration Scandium:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB 3B Sc Scandium 44.956	4 IVB 4B Ti Titanium 47.867	5 VB 5B V Vanadium 50.942	6 VIB 6B Cr Chromium 51.996	7 VIIB 7B Mn Manganese 54.938	8 VIII 8 Fe Iron 55.845	9 VIII 8 Co Cobalt 58.933	10 VIII 8 Ni Nickel 58.693	11 IB 1B Cu Copper 63.546	12 IIB 2B Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948		
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.799		

# 1. Wie bestimmt man die Elektronenkonfiguration?

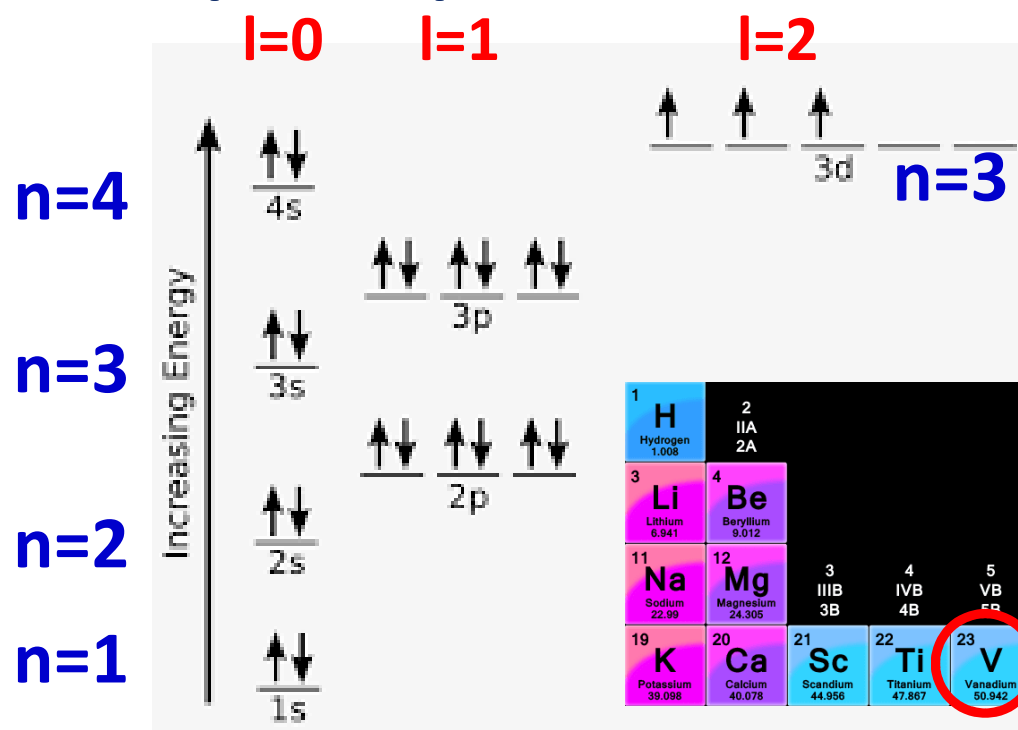
Elektronenkonfiguration Titan:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$



1 H Hydrogen 1.008	2 IIA Be Beryllium 9.012											13 IIIA Al Aluminum 26.982	14 IVA Si Silicon 28.086	15 VA P Phosphorus 30.974	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.453	18 Ar Argon 39.948	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.956	4 IVB Ti Titanium 47.867	5 VB V Vanadium 50.942	6 VIB Cr Chromium 51.996	7 VIIB Mn Manganese 54.938	8 Fe Iron 55.845	9 VIII Co Cobalt 58.933	10 Ni Nickel 58.693	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

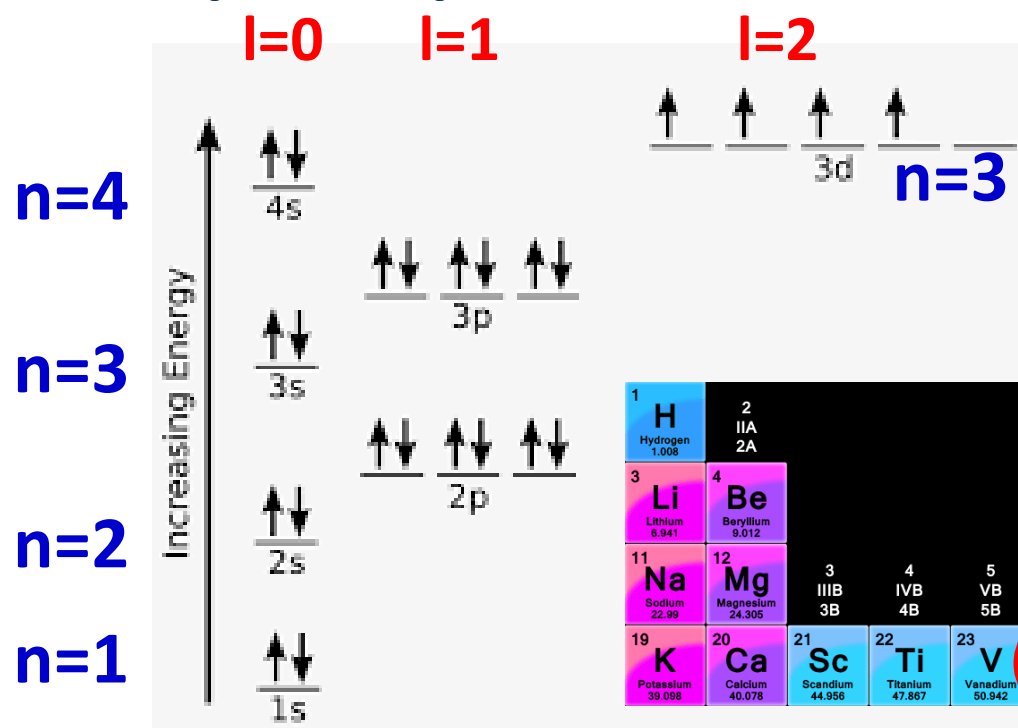
Elektronenkonfiguration Vanadium:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB 3B Sc Scandium 44.956	4 IVB 4B Ti Titanium 47.867	5 VB 5B V Vanadium 50.942	6 VIB 6B Cr Chromium 51.996	7 VIIB 7B Mn Manganese 54.938	8 VIII 8 Fe Iron 55.845	9 VIII 8 Co Cobalt 58.933	10 VIII 8 Ni Nickel 58.693	11 IB 1B Cu Copper 63.546	12 IIB 2B Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948		
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789		

# 1. Wie bestimmt man die Elektronenkonfiguration?

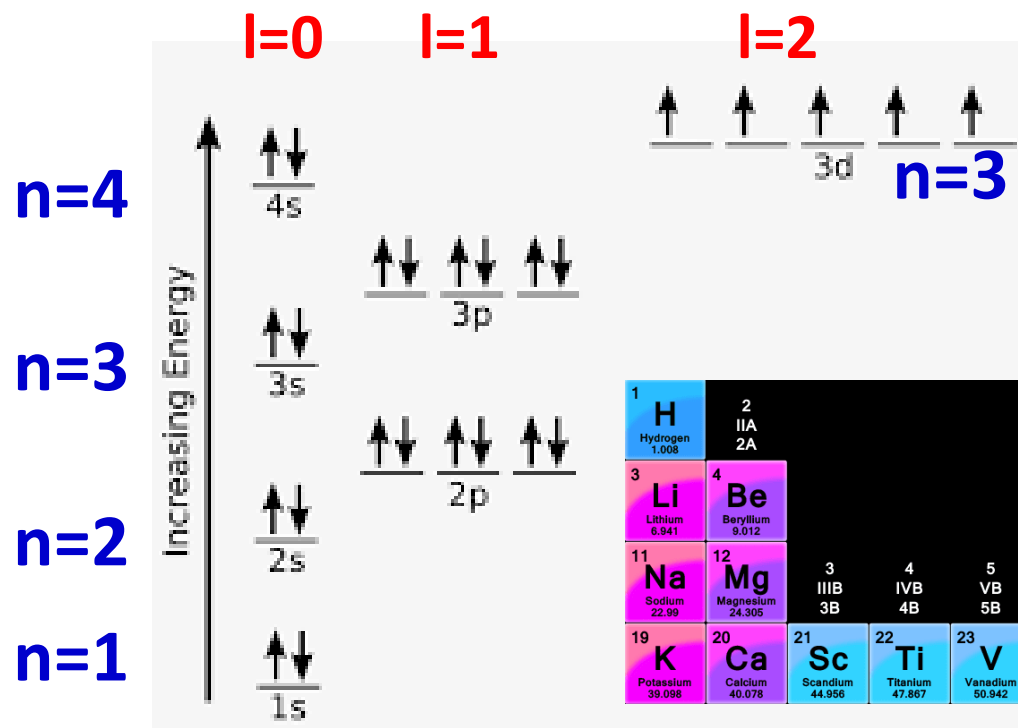
Elektronenkonfiguration Chrom:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 VIIIA 8A Ne Neon 20.180	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB 3B Sc Scandium 44.956	4 IVB 4B Ti Titanium 47.867	5 VB 5B V Vanadium 50.942	6 VIB 6B Cr Chromium 51.998	7 VIIB 7B Mn Manganese 54.938	8 VIII 8 Fe Iron 55.845	9 VIII 9 Co Cobalt 58.933	10 VIII 10 Ni Nickel 58.693	11 IB 1B Cu Copper 63.546	12 IIB 2B Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948	
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.998	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789	

# 1. Wie bestimmt man die Elektronenkonfiguration?

Elektronenkonfiguration Mangan:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$

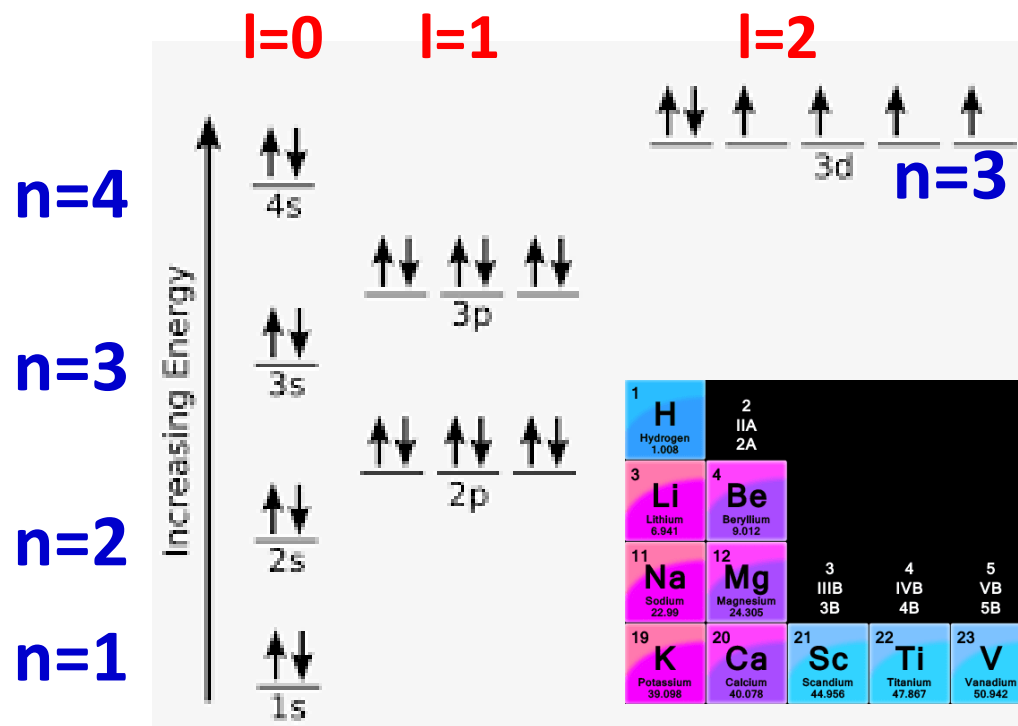


1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 Ne Neon 20.180	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.789
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# 1. Wie bestimmt man die Elektronenkonfiguration?

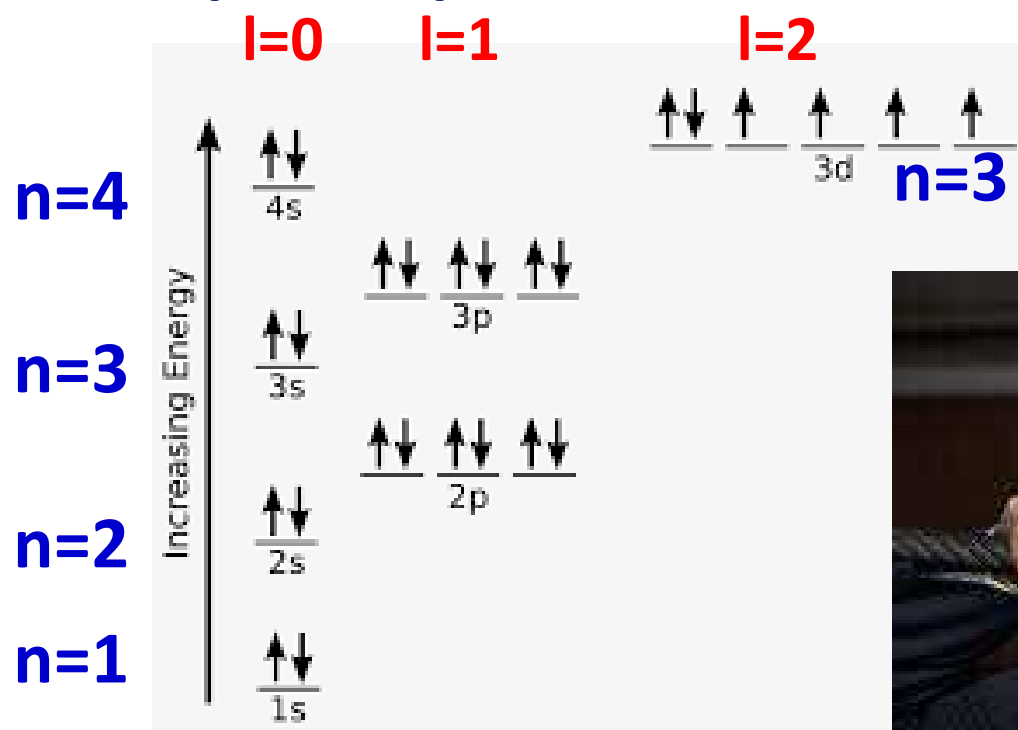
## Elektronenkonfiguration Eisen:



1 H Hydrogen 1.008	2 IIA 2A Be Beryllium 9.012											13 IIIA 3A B Boron 10.811	14 IVA 4A C Carbon 12.011	15 VA 5A N Nitrogen 14.007	16 VIA 6A O Oxygen 15.999	17 VIIA 7A F Fluorine 18.998	18 Ne Neon 20.180	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180		
11 Na Sodium 22.99	12 Mg Magnesium 24.305	3 IIIB 3B Sc Scandium 44.956	4 IVB 4B Ti Titanium 47.867	5 VB 5B V Vanadium 50.942	6 VIB 6B Cr Chromium 51.996	7 VIIB 7B Mn Manganese 54.938	8 VIII 8 Fe Iron 55.845	9 VIII 8 Co Cobalt 58.933	10 VIII 8 Ni Nickel 58.693	11 IB 1B Cu Copper 63.546	12 IIB 2B Zn Zinc 65.38	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948		
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.799		

# 1. Wie bestimmt man die Elektronenkonfiguration?

Elektronenkonfiguration Eisen:  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$

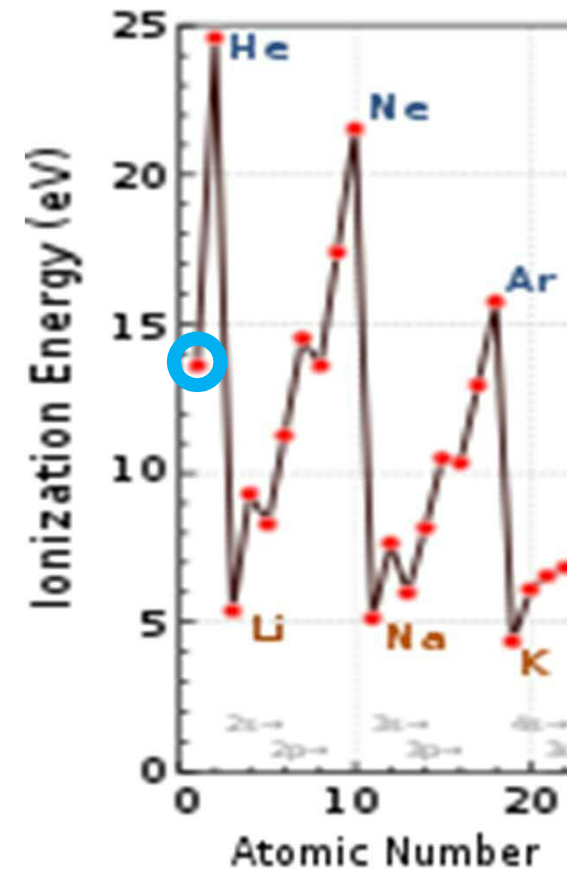
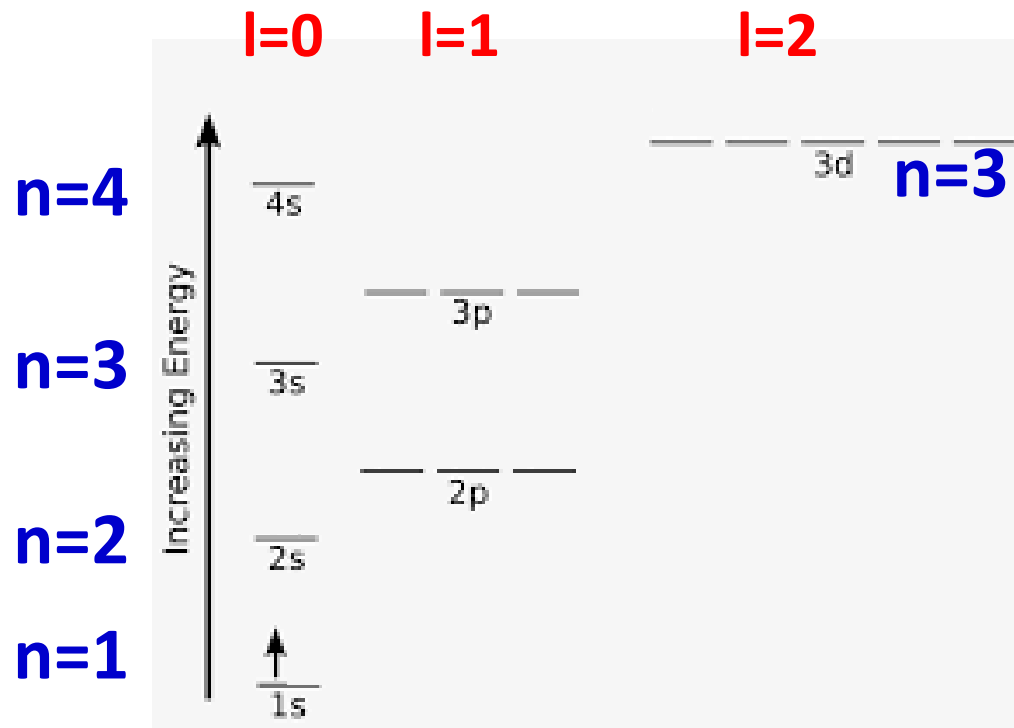


Noch ein  
bisschen  
Power  
übrig?



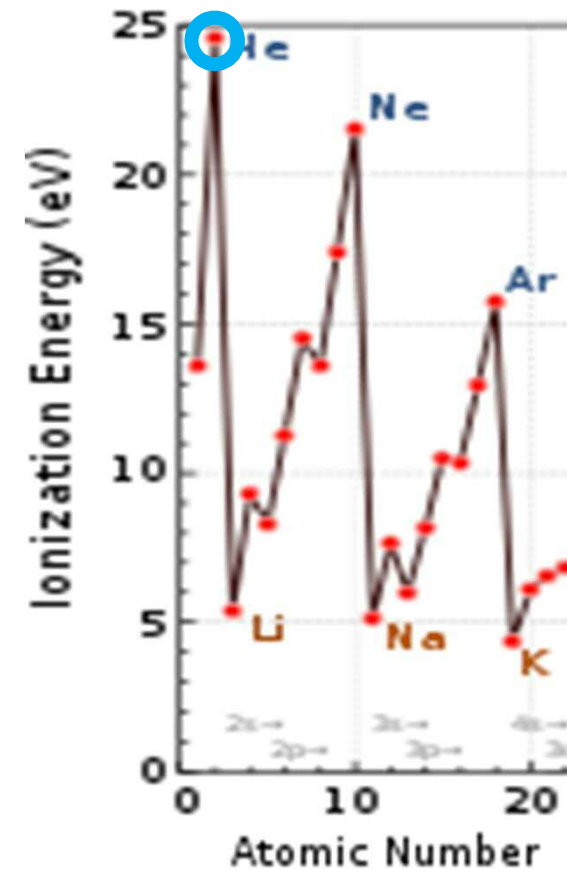
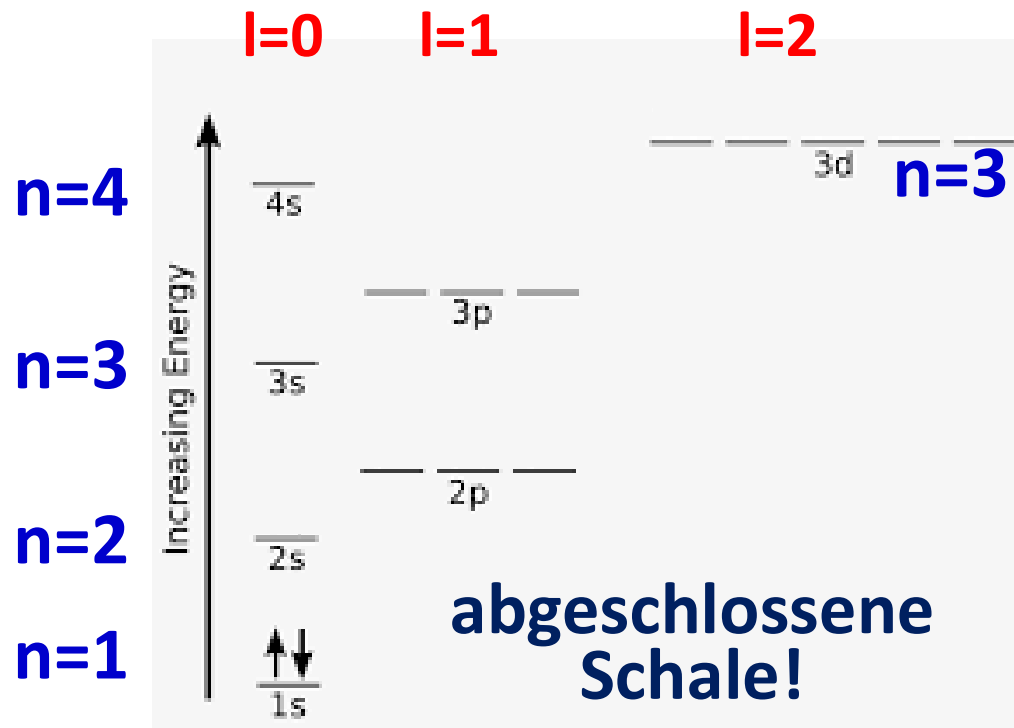
# Elektronenkonfiguration und Ionisierungsenergie

## Elektronenkonfiguration Wasserstoff: $1s^1$



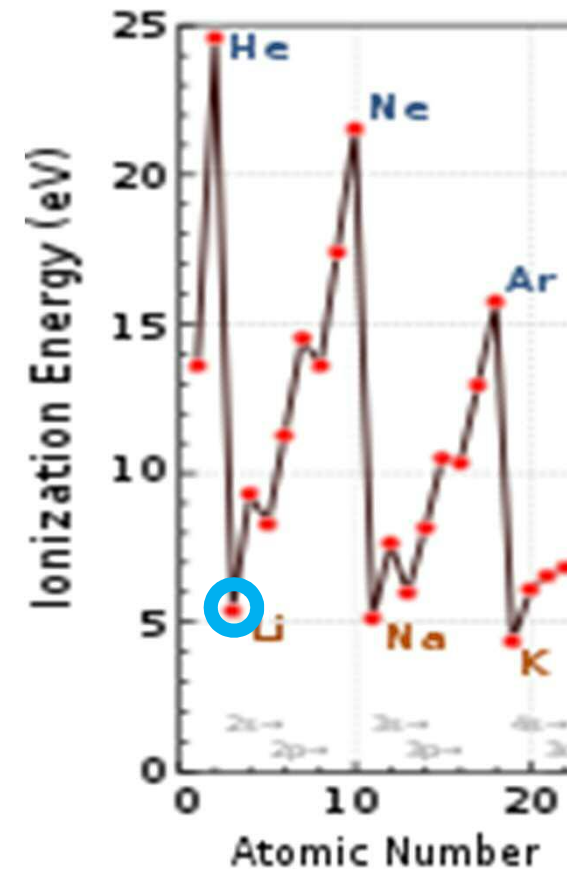
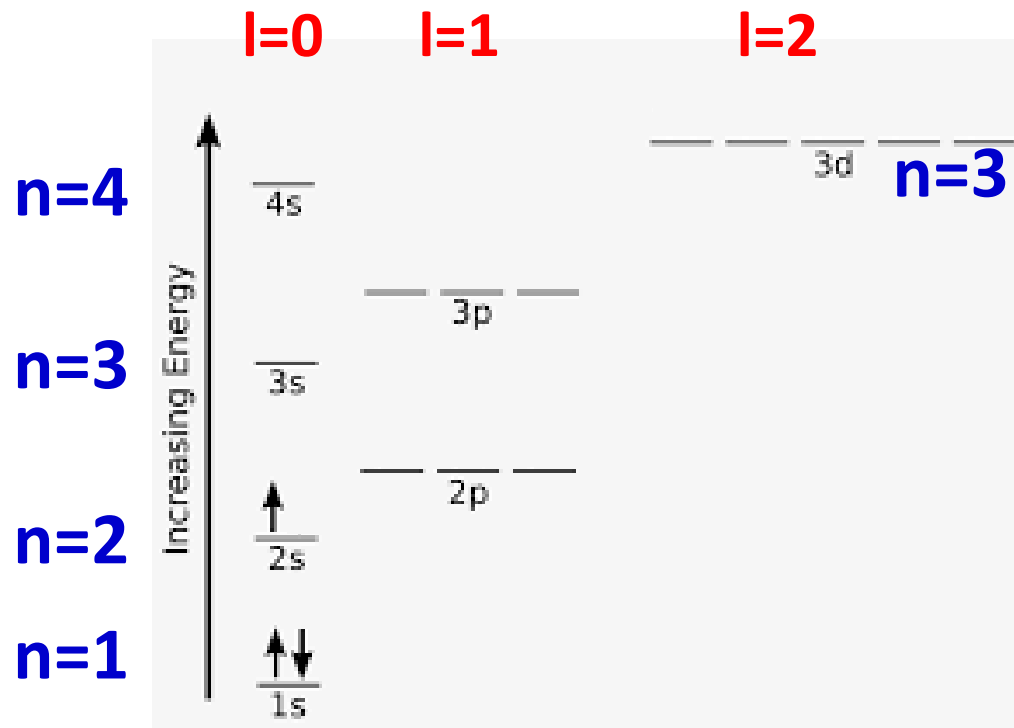
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Helium:  
 $1s^2$



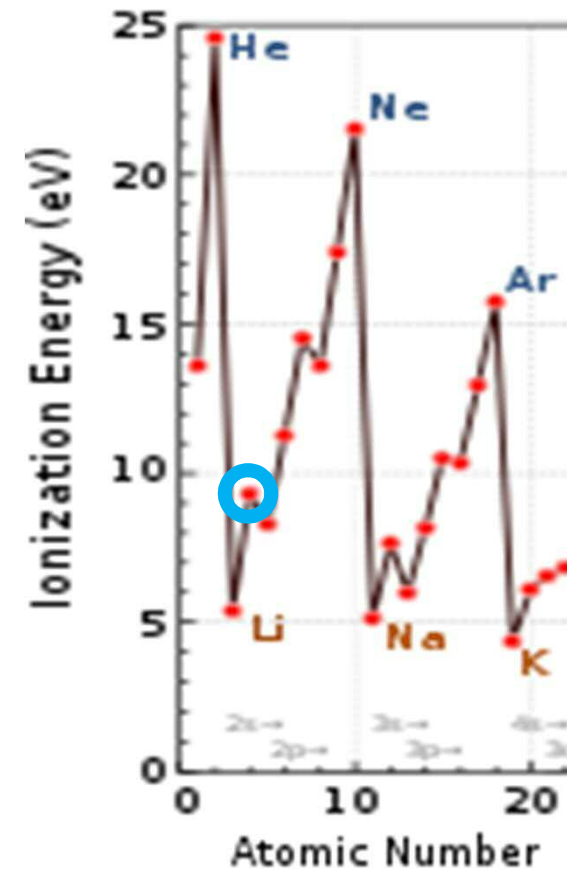
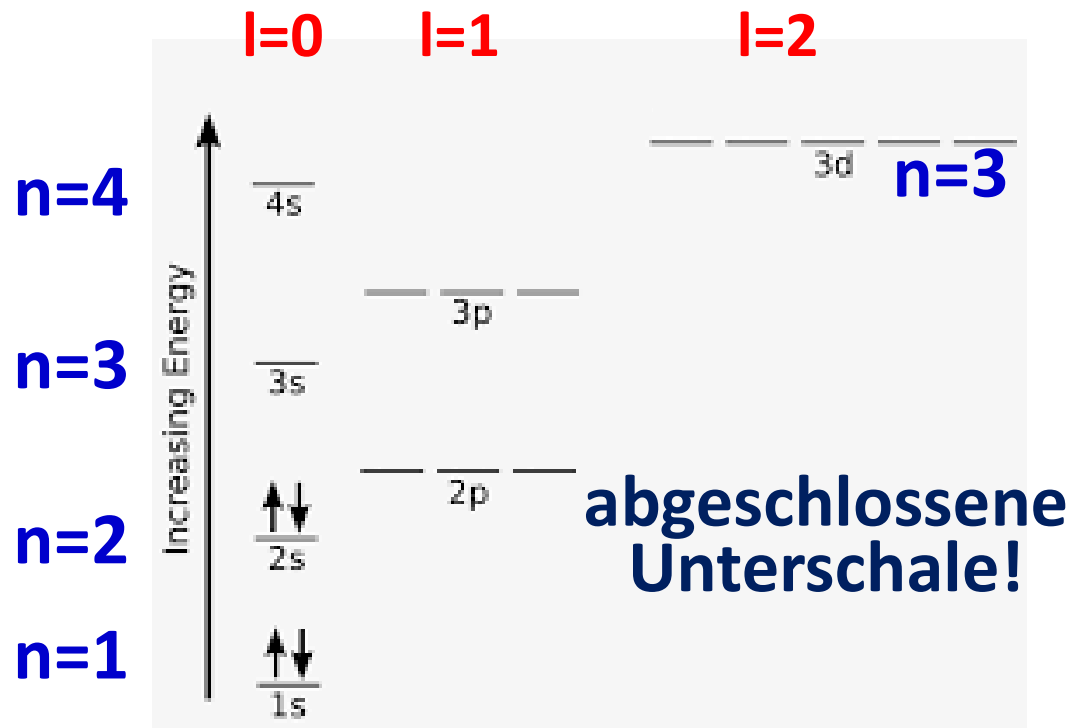
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Lithium:  
 $1s^2 2s^1$



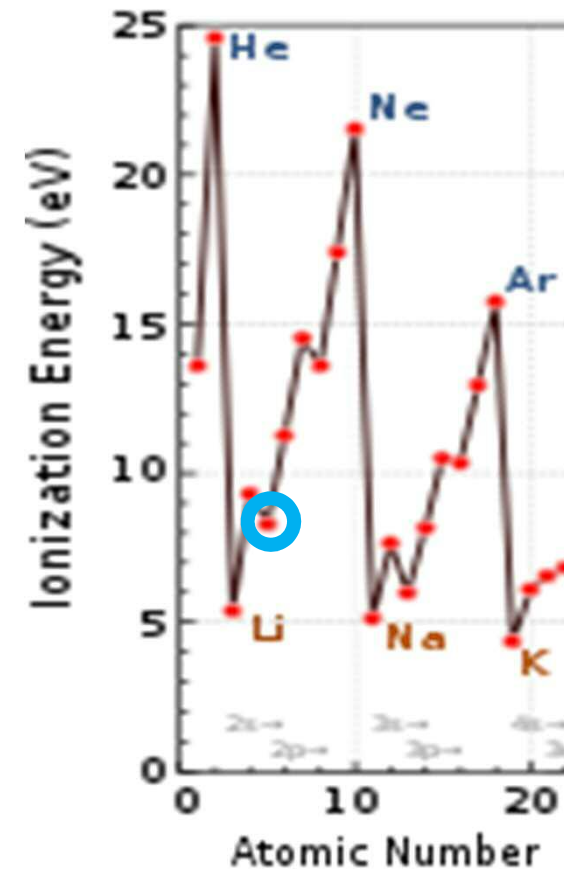
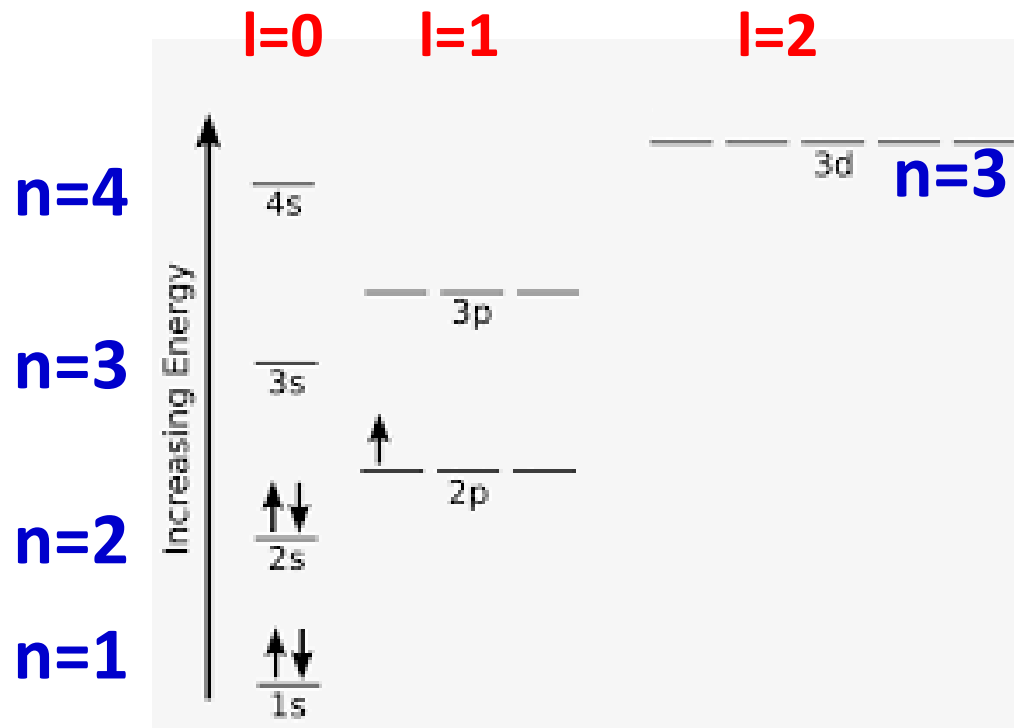
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Beryllium:  
 $1s^2 2s^2$

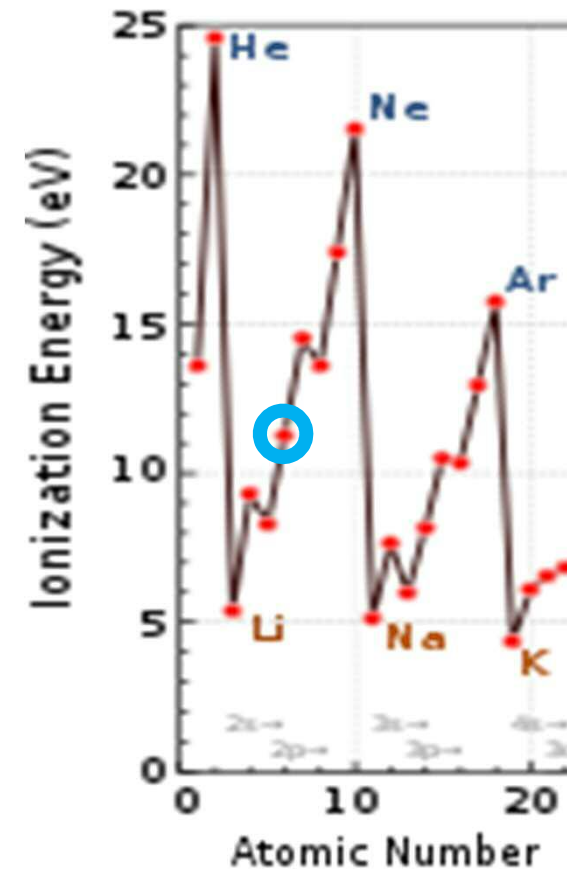
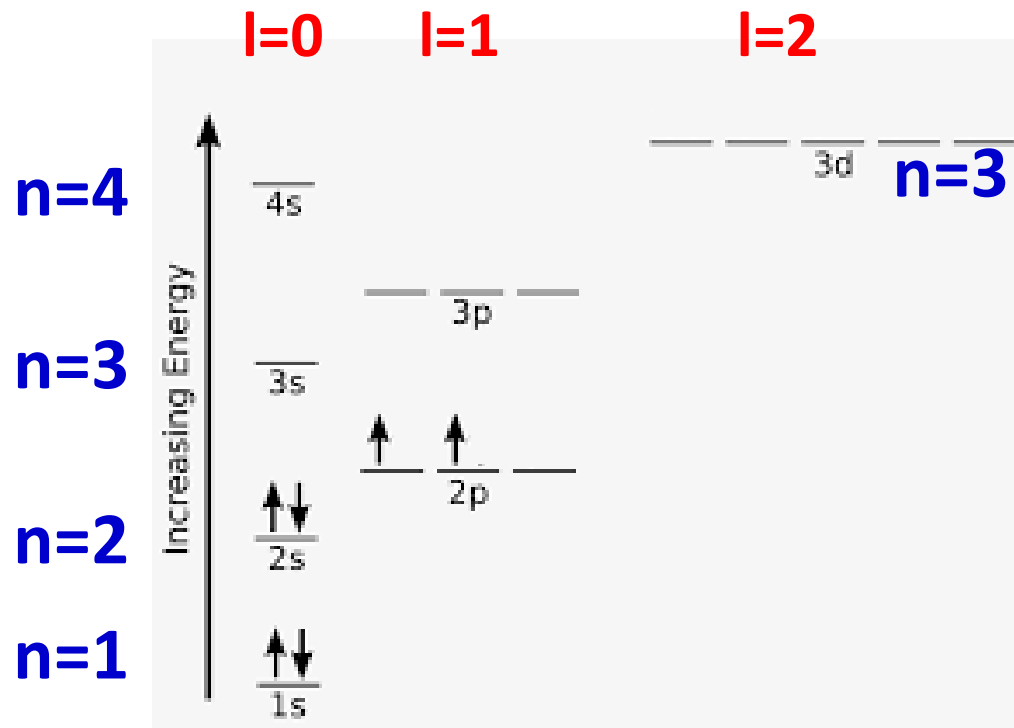


# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Bor:  
 $1s^2 2s^2 2p^1$



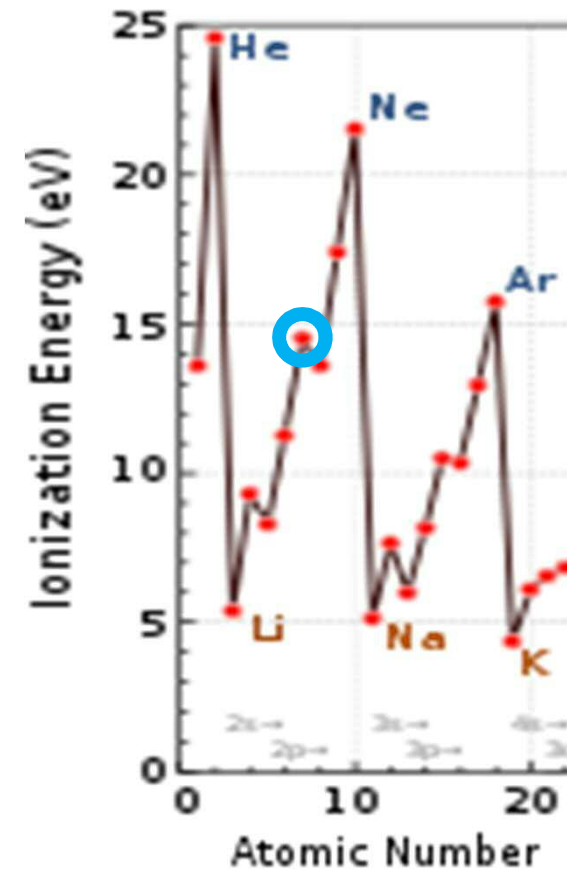
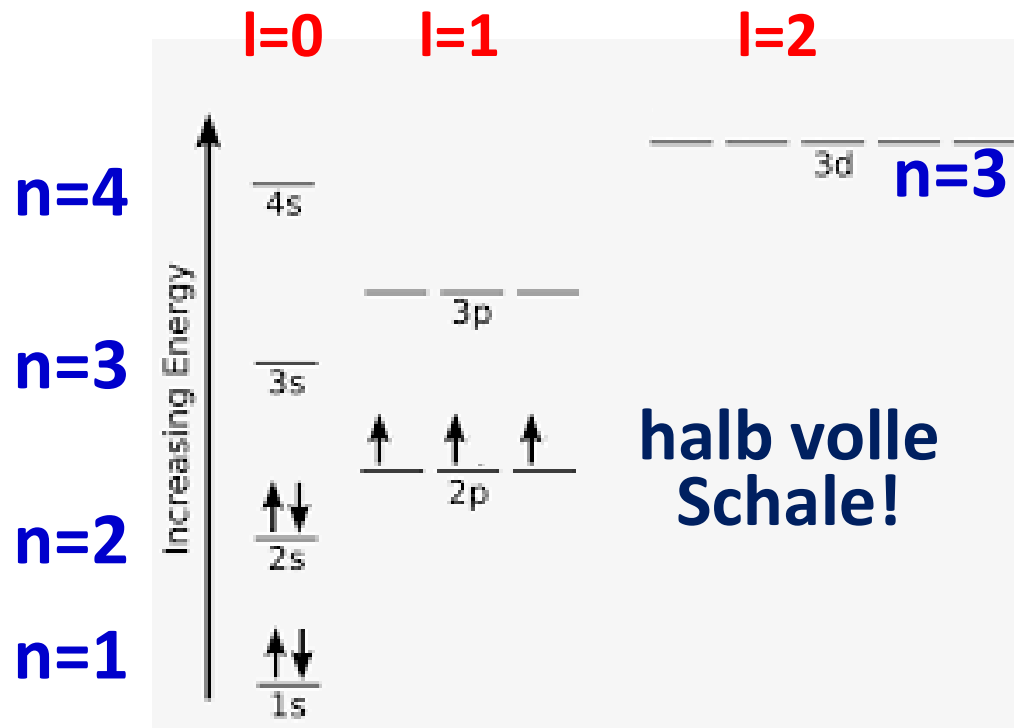
# Elektronenkonfiguration Kohlenstoff: $1s^2 2s^2 2p^2$





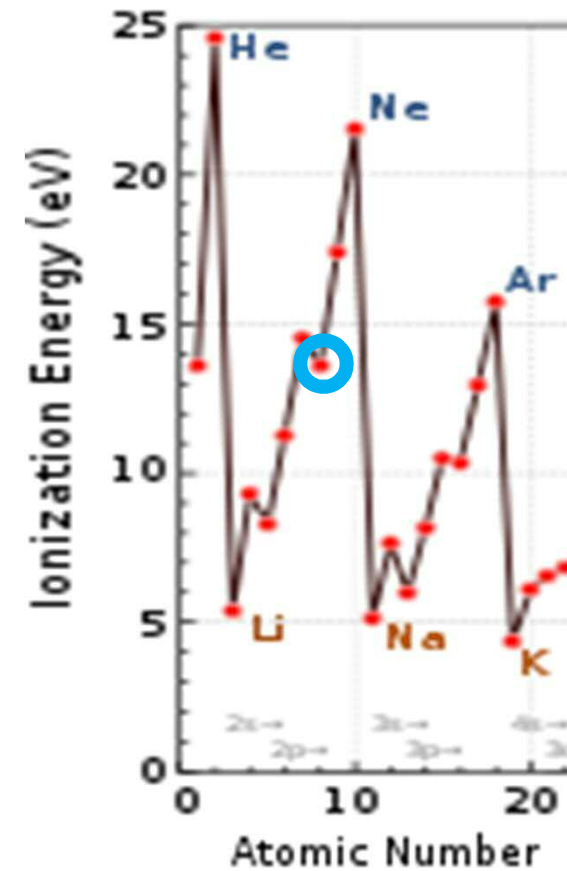
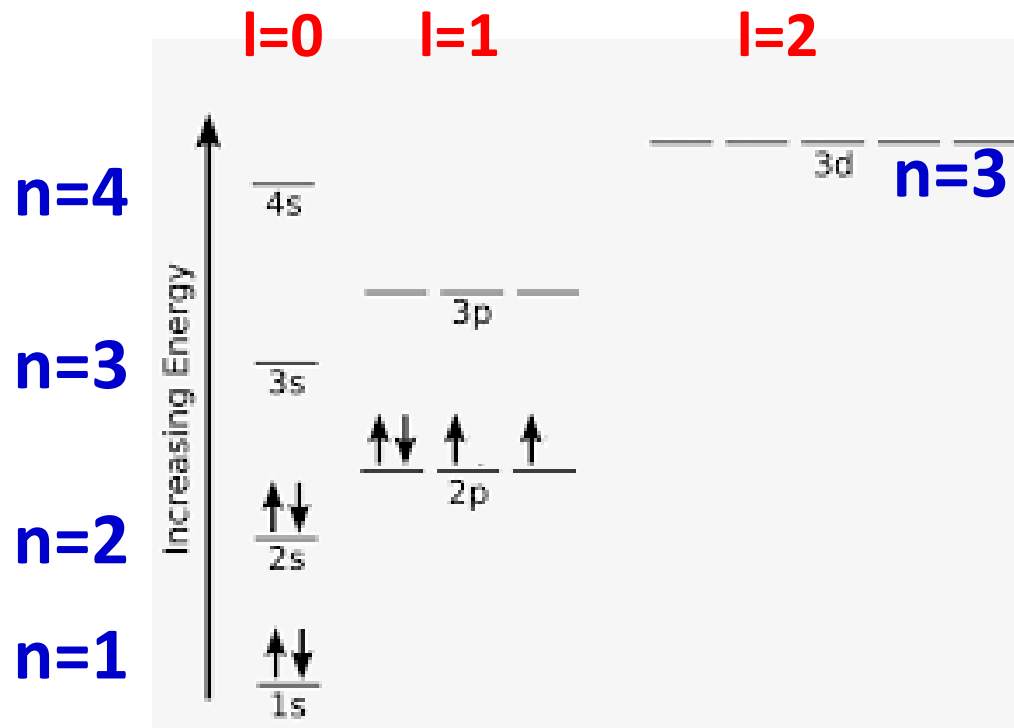
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Stickstoff:  
 $1s^2 2s^2 2p^3$



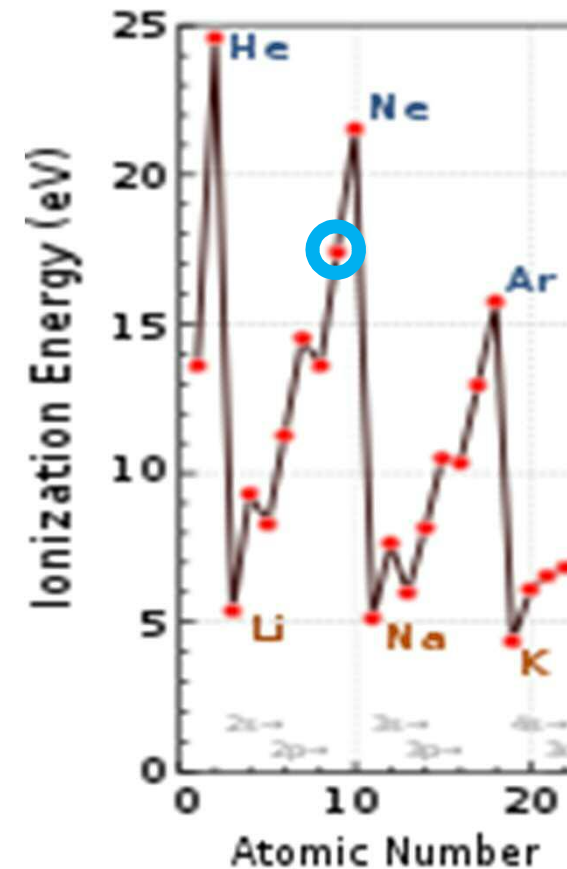
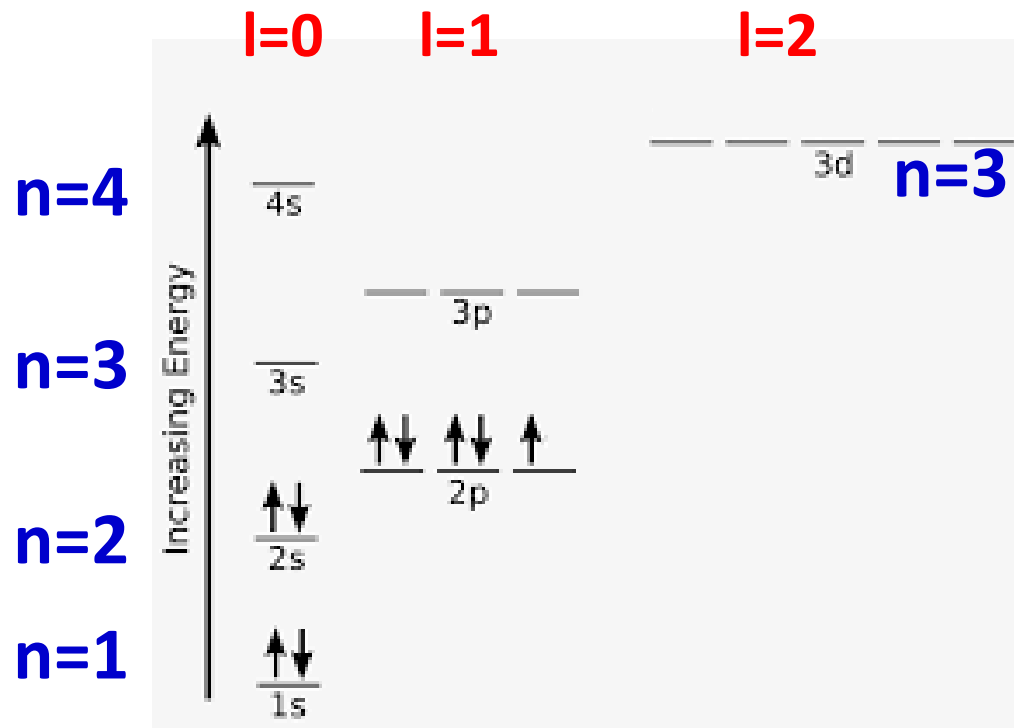
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Sauerstoff:  
 $1s^2 2s^2 2p^4$



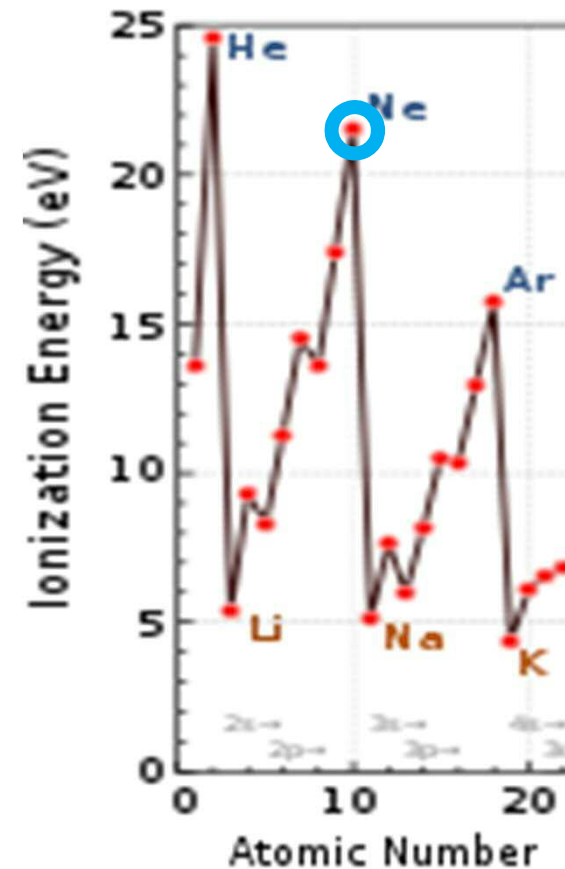
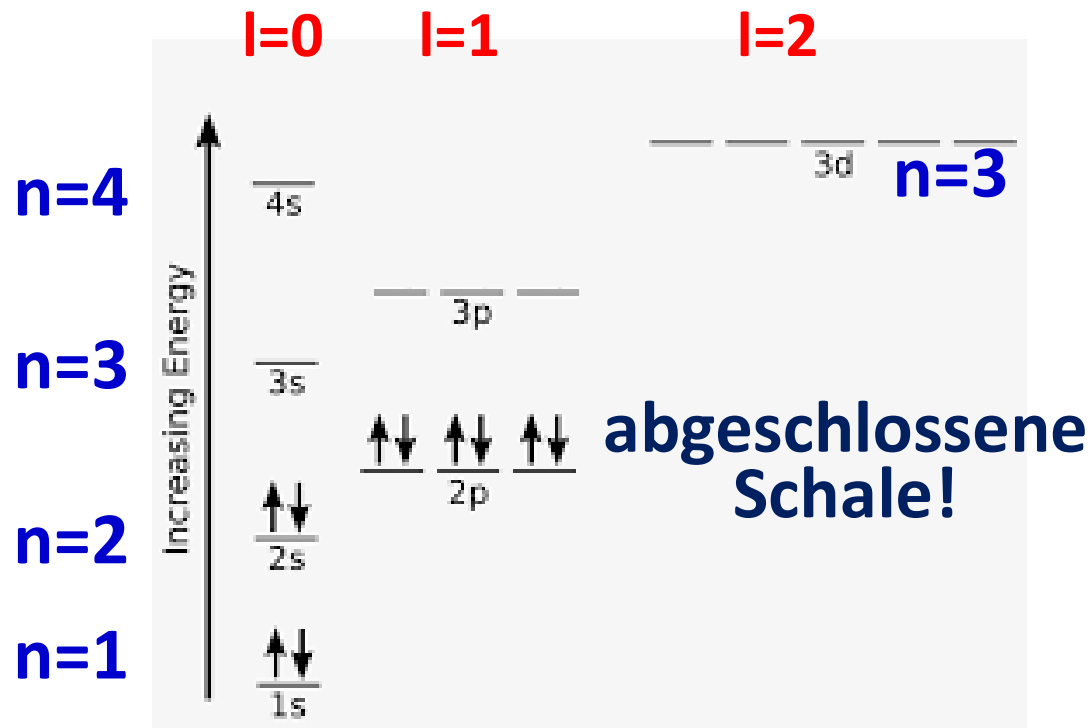
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Fluor:  
 $1s^2 2s^2 2p^5$



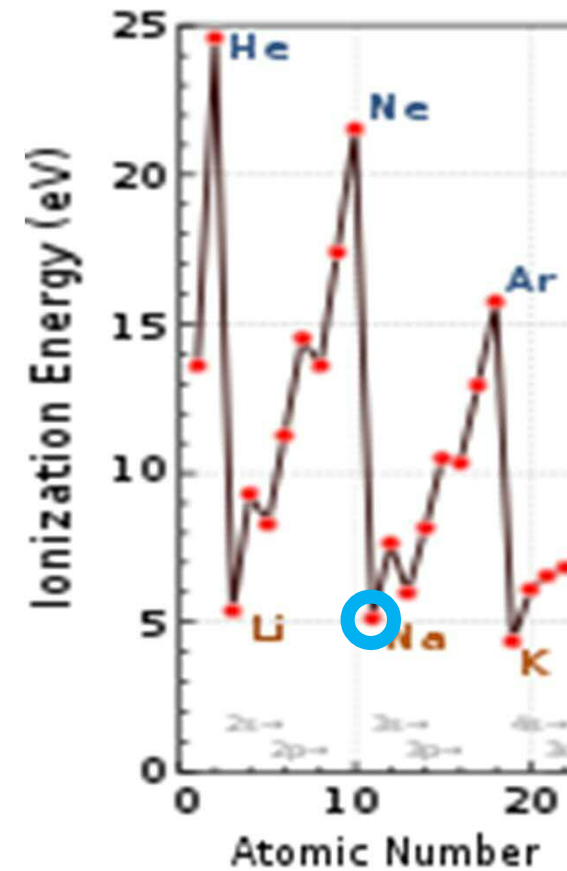
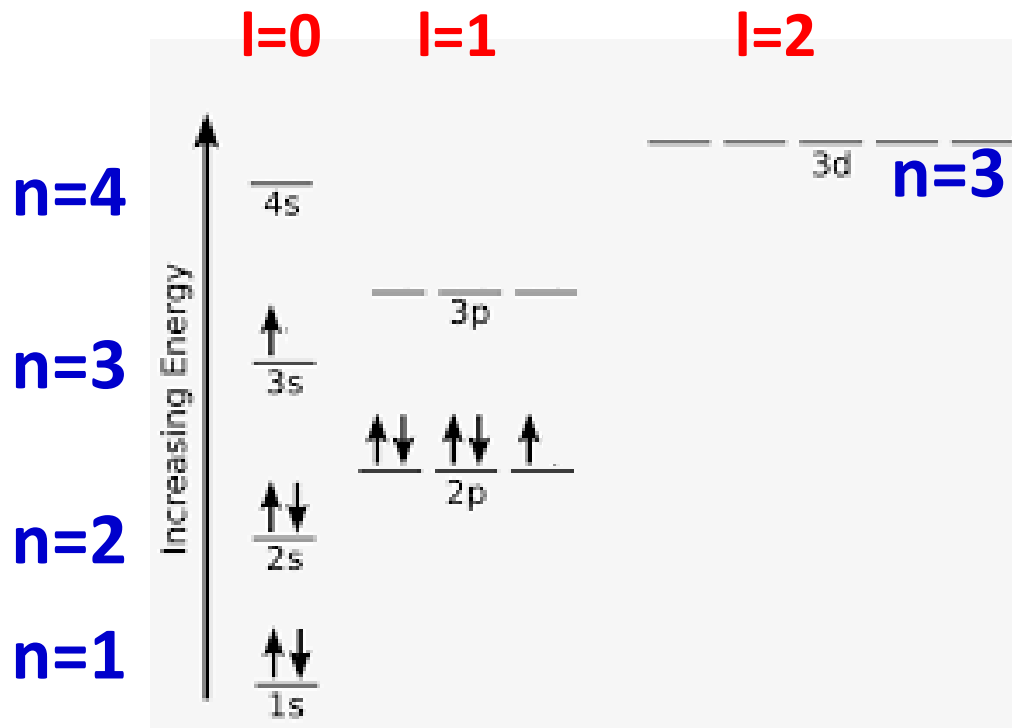
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Neon:  
 $1s^2 2s^2 2p^6$



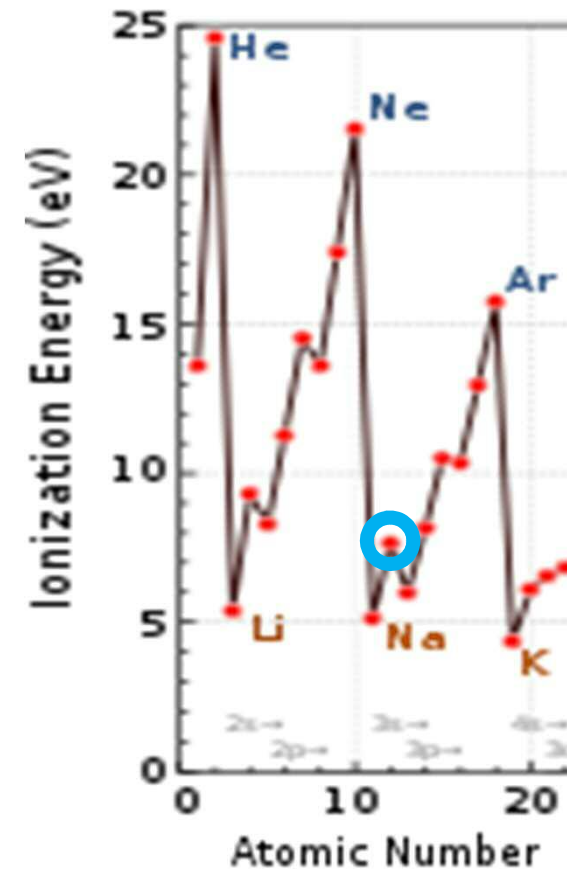
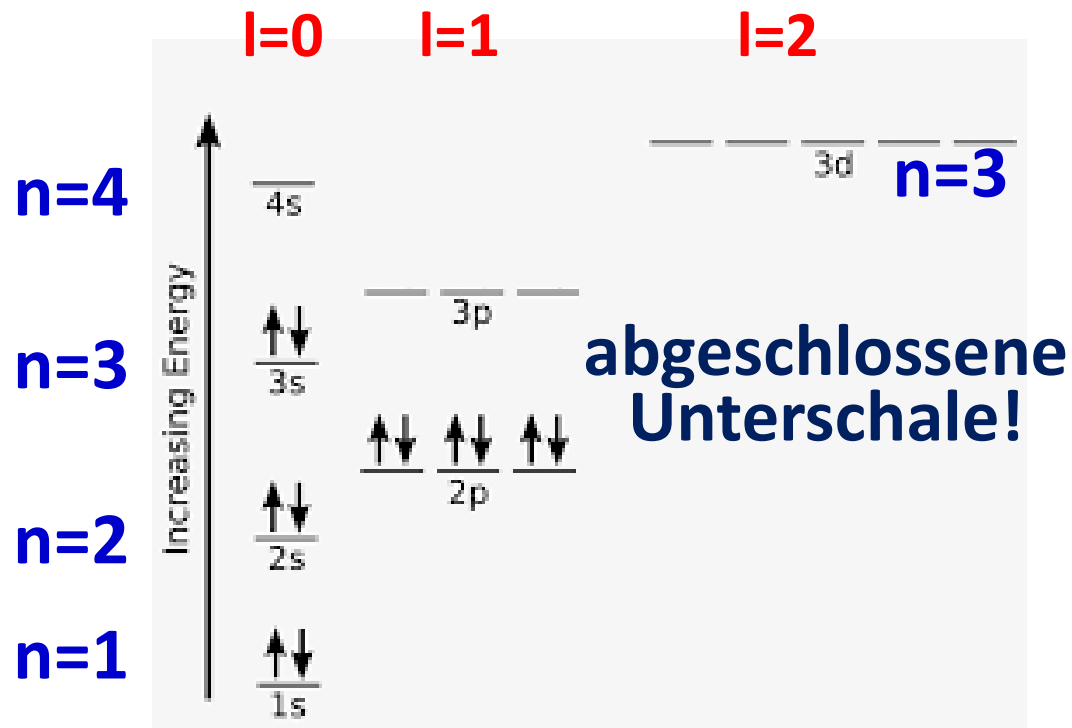
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Natrium:  
 $1s^2 2s^2 2p^6 3s^1$



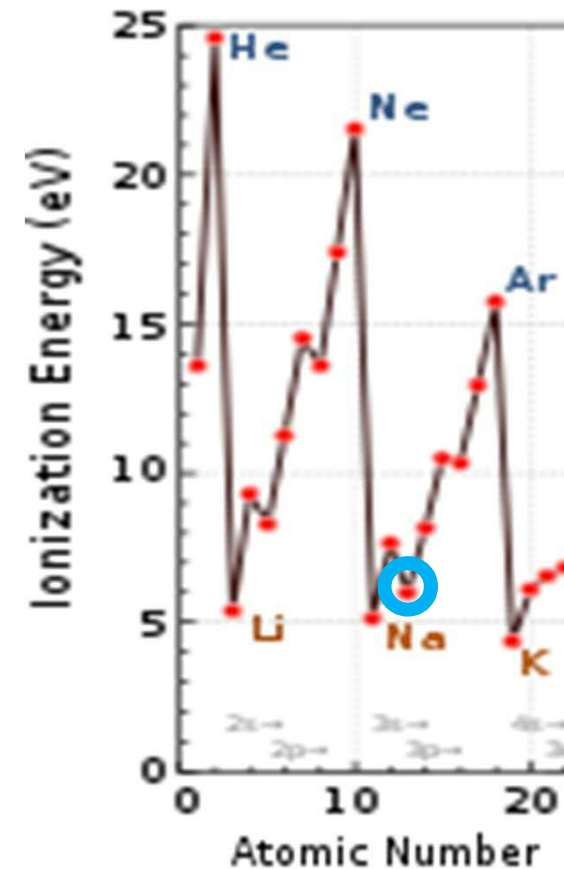
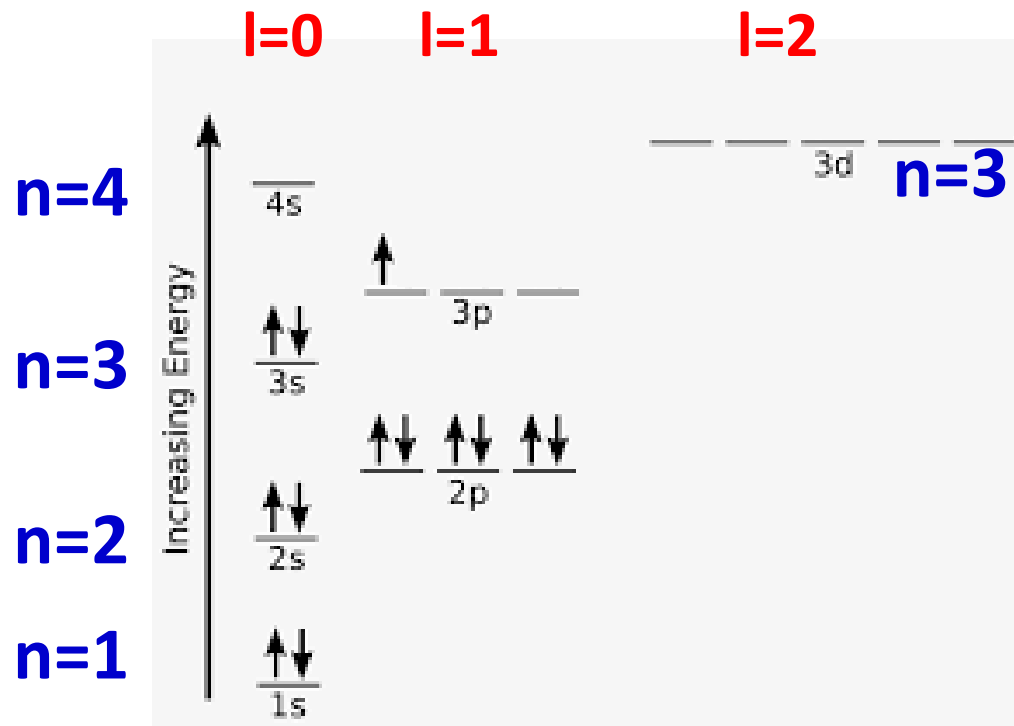
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Magnesium:  
 $1s^2 2s^2 2p^6 3s^2$



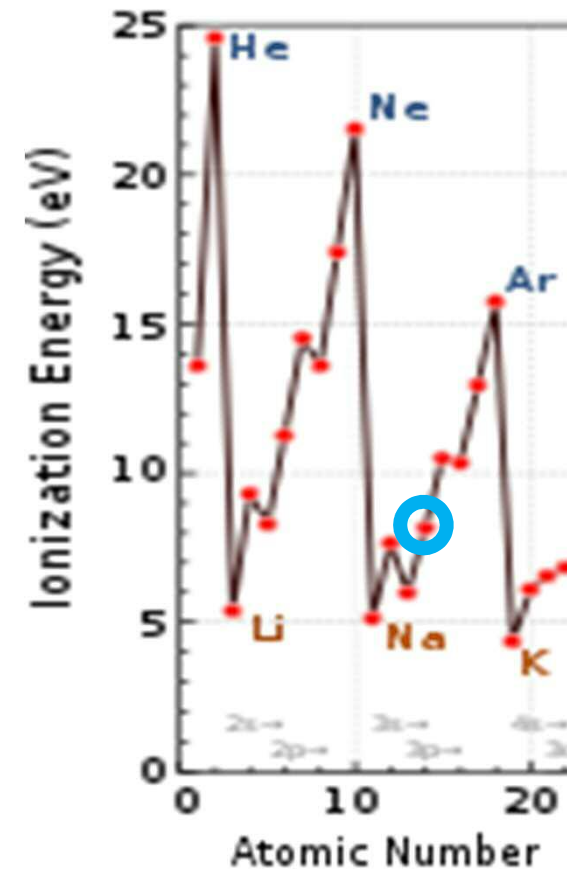
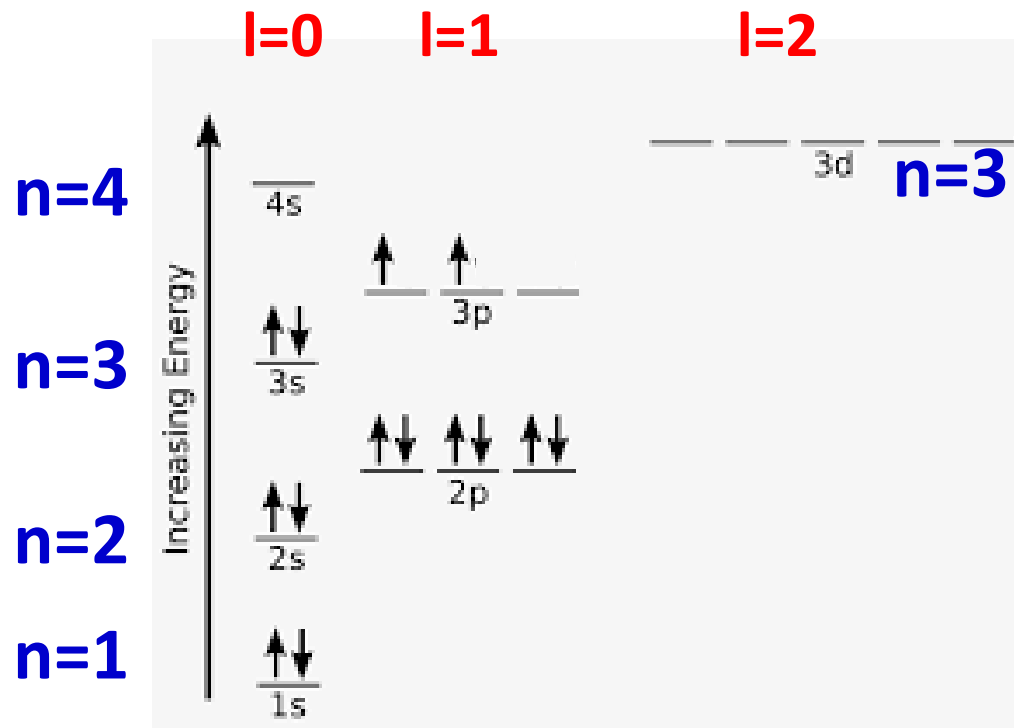
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Aluminium:  
 $1s^2 2s^2 2p^6 3s^2 3p^1$



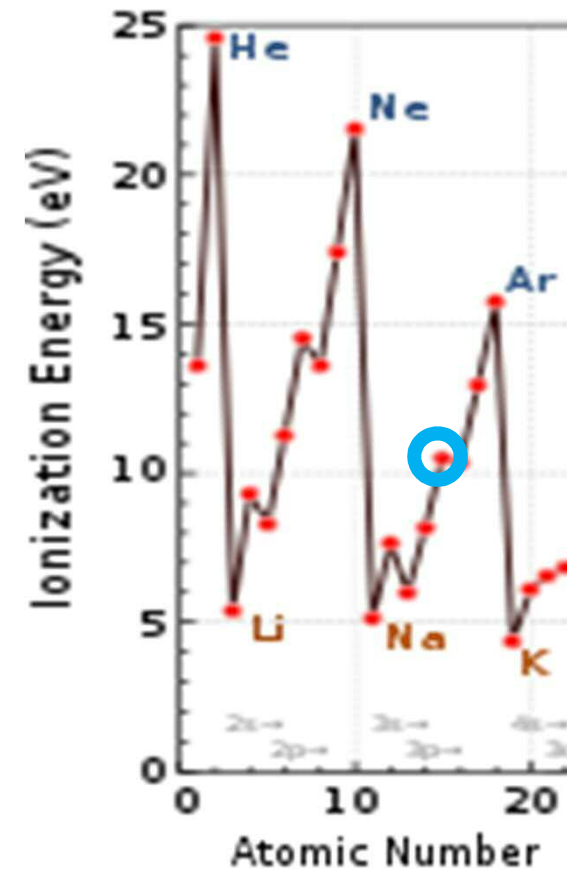
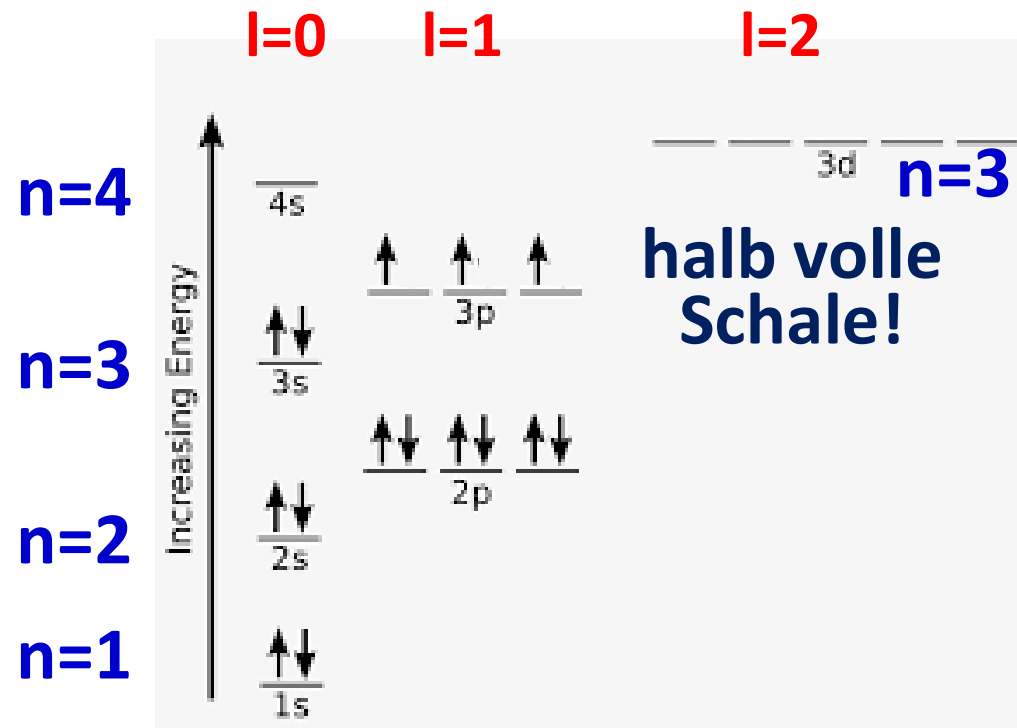
# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Silizium:  
 $1s^2 2s^2 2p^6 3s^2 3p^2$

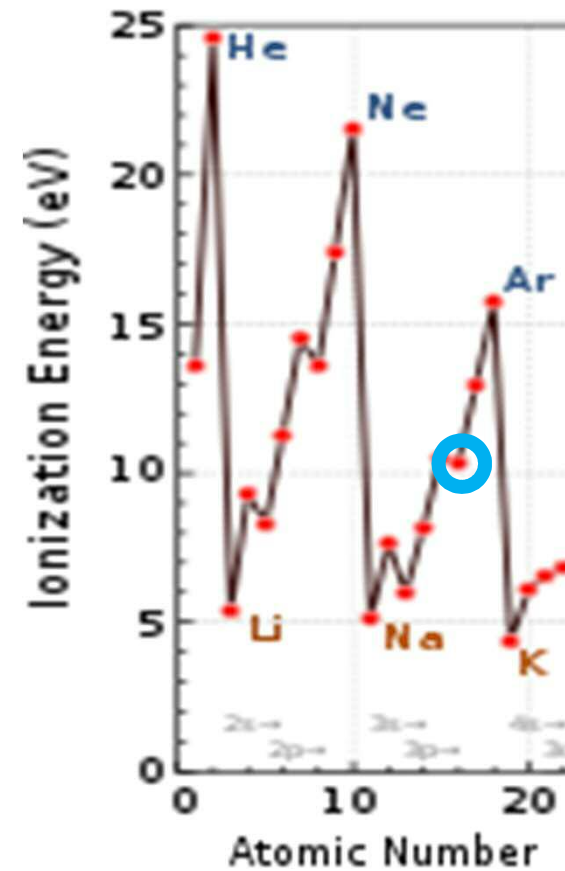
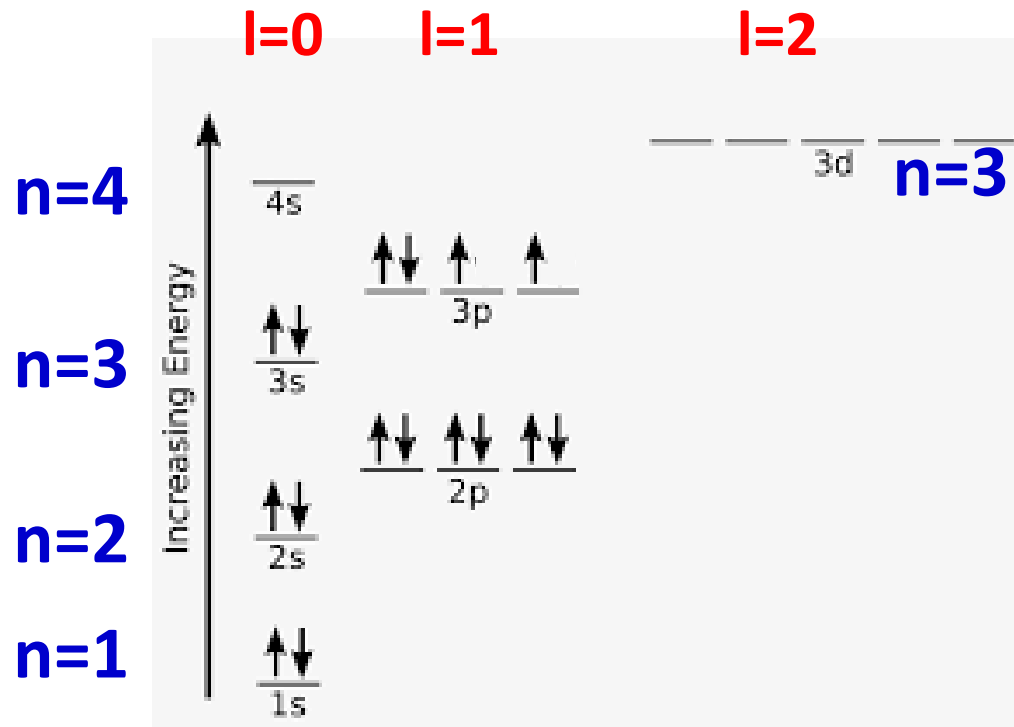




# Elektronenkonfiguration Phosphor: $1s^2 2s^2 2p^6 3s^2 3p^3$

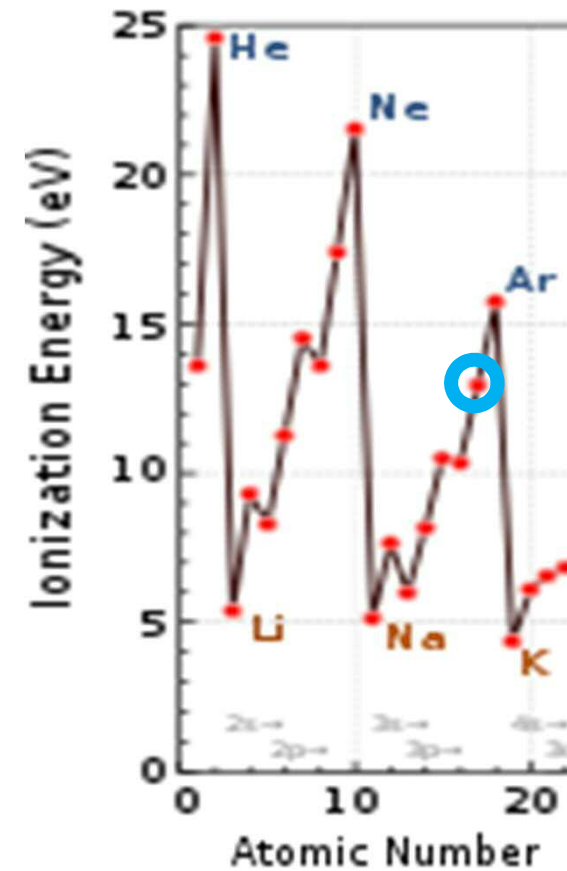
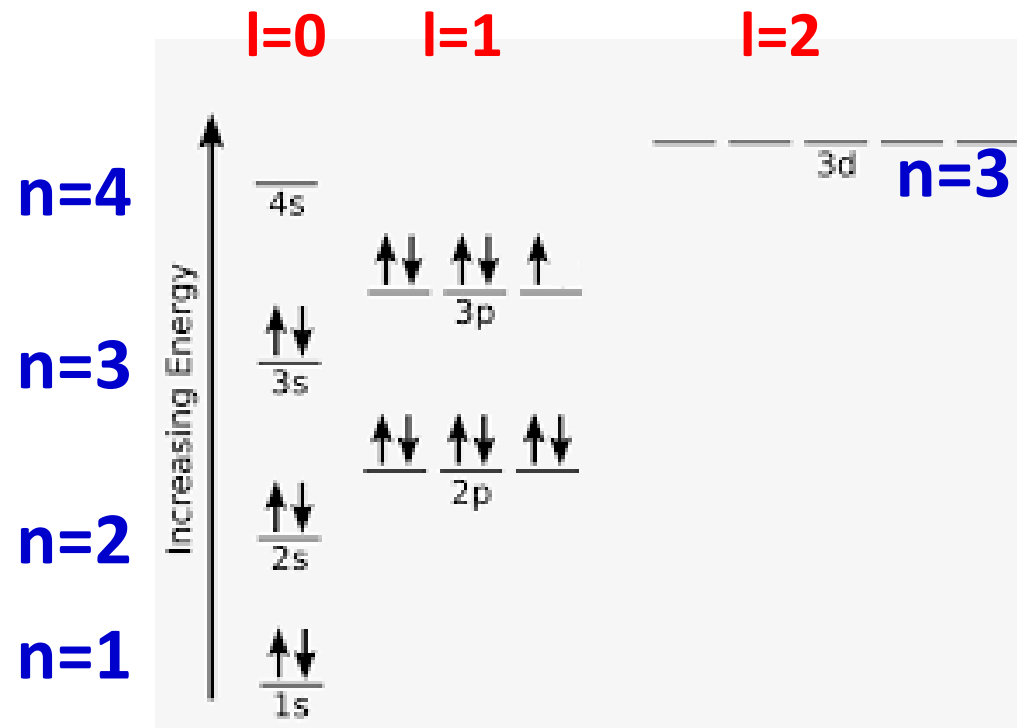


# Elektronenkonfiguration Schwefel: $1s^2 2s^2 2p^6 3s^2 3p^4$



# Elektronenkonfiguration Chlor:

$1s^2 2s^2 2p^6 3s^2 3p^5$



# Elektronenkonfiguration und Ionisierungsenergie

Elektronenkonfiguration Argon:  
 $1s^2 2s^2 2p^6 3s^2 3p^6$  [Ar]

