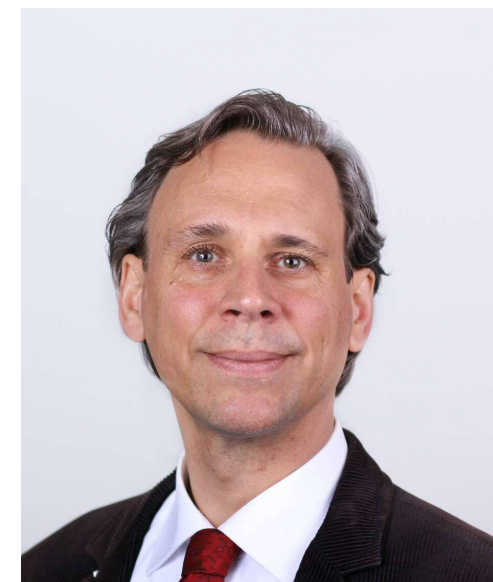
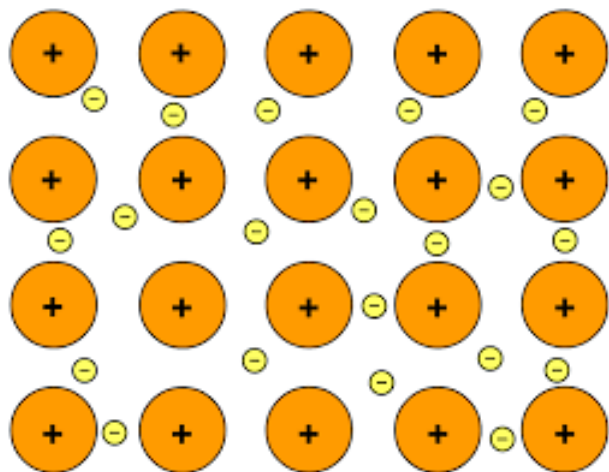


Atome in Verbänden – chemische Bindung

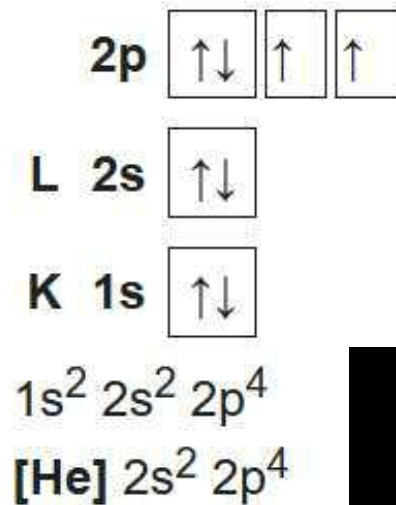


Prof. S. Schlücker

- 1. Was ist die Lewis-Schreibweise?**
2. Was bestimmt die Wertigkeit eines Elements?
3. Was unterscheidet die Bindung in Metallen von der kovalenten Atombindung und der Ionenbindung?

1. Was ist die Lewis-Schreibweise?

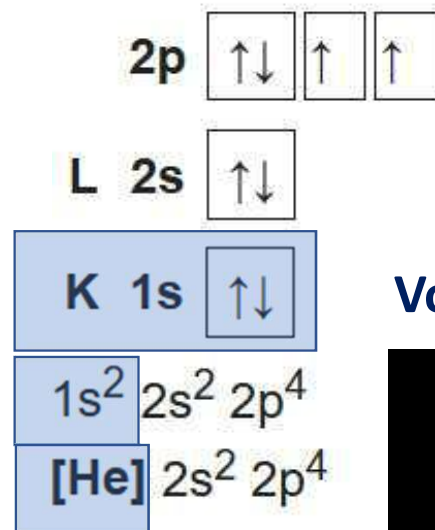
Elektronenkonfiguration (atomarer) Sauerstoff



| | | | | | | | |
|-----------------------------|-------------------------------|---------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| 1 H Hydrogen 1.008 | | | | | | | 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 |

1. Was ist die Lewis-Schreibweise?

Elektronenkonfiguration (atomarer) Sauerstoff

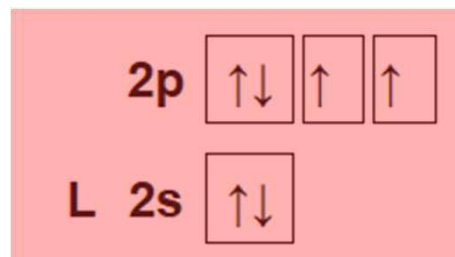


Vollständig abgeschlossene Schale (Edelgaskonfiguration!)

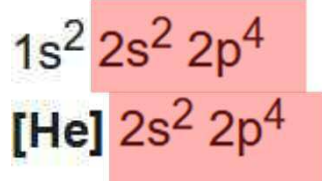
| | | | | | | | |
|-----------------------------|-------------------------------|---------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| 1 H Hydrogen 1.008 | | | | | | | 2 He Helium 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 |

1. Was ist die Lewis-Schreibweise?

Elektronenkonfiguration (atomarer) Sauerstoff



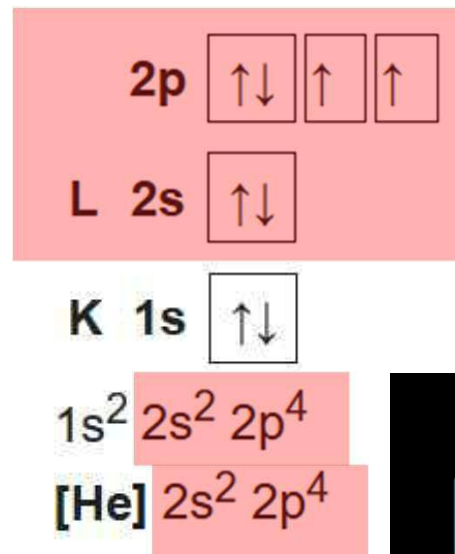
**Nicht abgeschlossene Schale
(keine Edelgaskonfiguration!)
Valenzelektronen
(für chemische Bindung!)**



| | | | | | | | |
|-----------------------------|-------------------------------|---------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| 1 H Hydrogen 1.008 | | | | | | | 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 |

1. Was ist die Lewis-Schreibweise?

Elektronenkonfiguration (atomarer) Sauerstoff



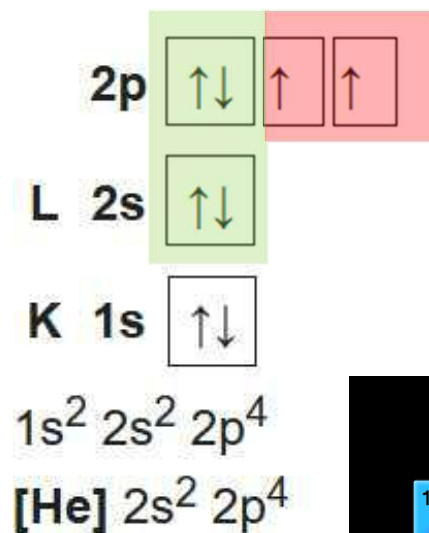
Lewis-Schreibweise (atomarer) Sauerstoff



| | | | | | | | | |
|-----------------------------|-------------------------------|---------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|----------------------------|
| 1 H Hydrogen 1.008 | | | | | | | | 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 | |

1. Was ist die Lewis-Schreibweise?

Elektronenkonfiguration (atomarer) Sauerstoff

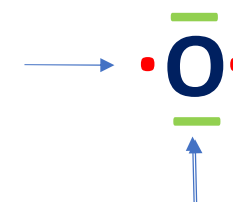


es fehlen 2 Elektronen
zur Neon-Konfiguration
(2. Periode: Oktett-Regel)

| | | | | | | | | |
|-----------------------------|-------------------------------|---------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|-------------------|
| 1 H Hydrogen 1.008 | | | | | | | | 2 He Helium |
| 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 | |

Lewis-Schreibweise (atomarer) Sauerstoff

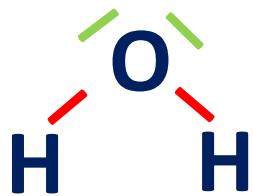
für chem. Bind. →



nichtbindendes
Elektronenpaar

1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise Moleküle mit Sauerstoff



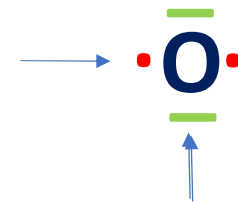
Wasser



Sauerstoff ist zweiwertig:
durch **Elektronenpaarbindung**
= Elektronen teilen (hier mit H)
erreicht es Neon-Konfiguration

Lewis-Schreibweise (atomarer) Sauerstoff

für chem. Bind. →

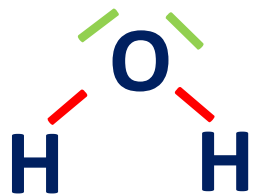


nichtbindendes
Elektronenpaar

1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

Moleküle mit Sauerstoff

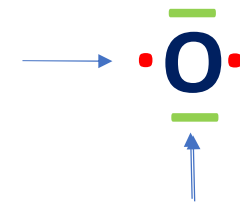


Wasser

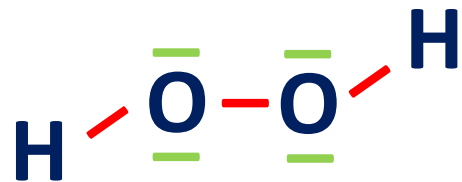
Lewis-Schreibweise

(atomarer) Sauerstoff

für chem. Bind.



nichtbindendes
Elektronenpaar



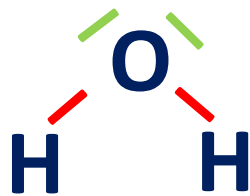
Wasserstoffperoxid



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

Moleküle mit Sauerstoff

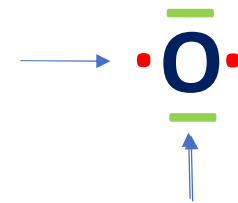


Wasser

Lewis-Schreibweise

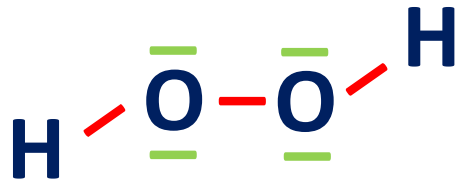
(atomarer) Sauerstoff

für chem. Bind. →



nichtbindendes
Elektronenpaar

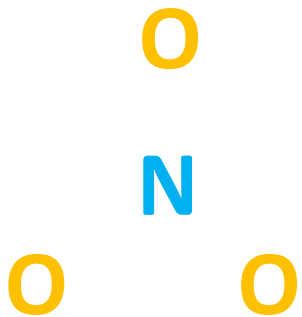
Wasserstoffperoxid



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

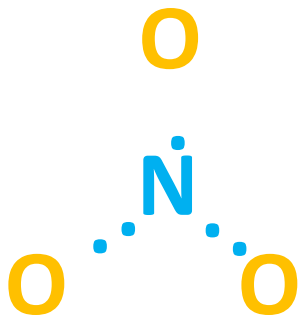
Nitrat (NO_3^-)



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

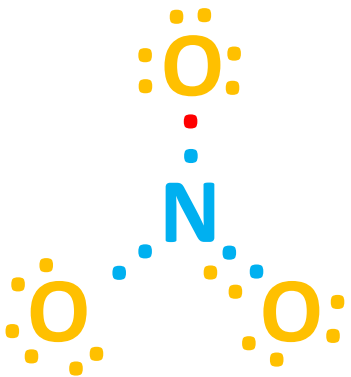
Nitrat (NO_3^-)



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

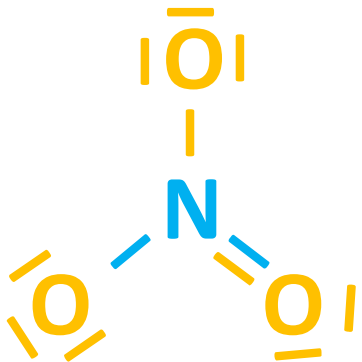
Nitrat (NO_3^-)



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

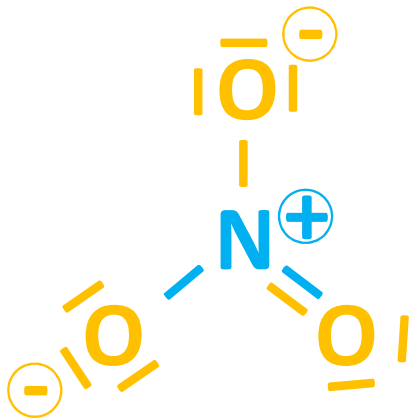
Nitrat (NO_3^-)



1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

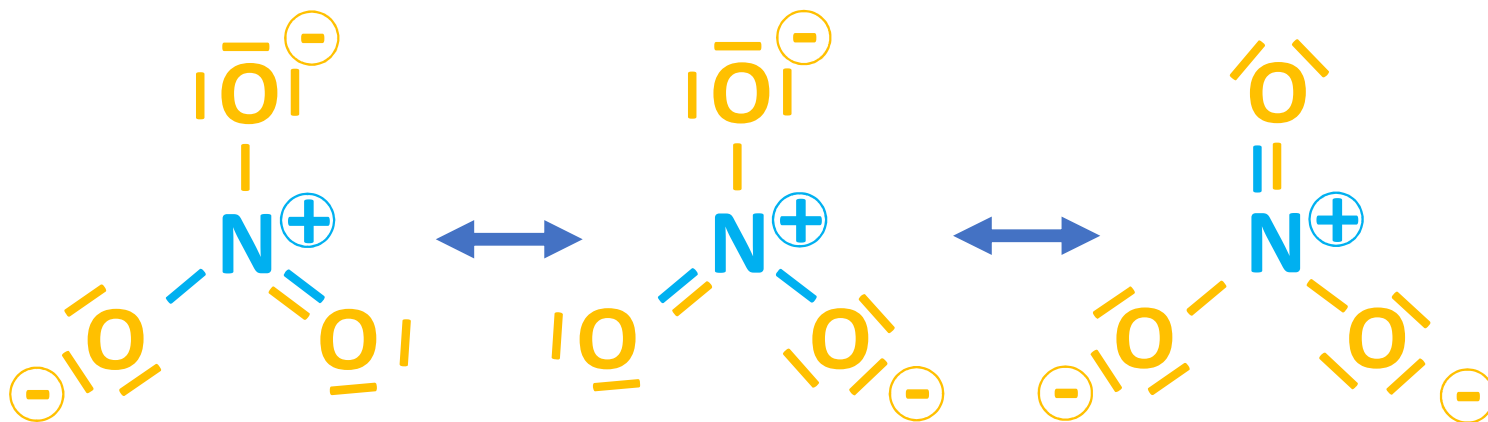
Nitrat (NO_3^-)



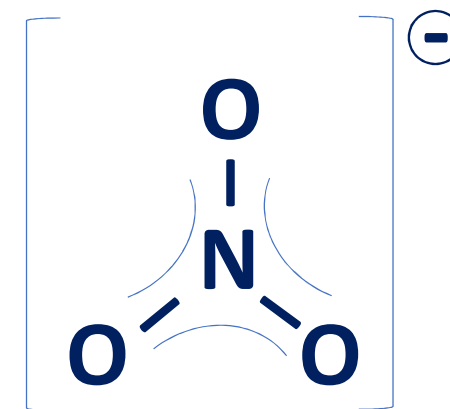
1. Was ist die Lewis-Schreibweise?

Lewis-Schreibweise

Nitrat (NO_3^-)



Mesomere Grenzstrukturen (je 33%)



Realität!