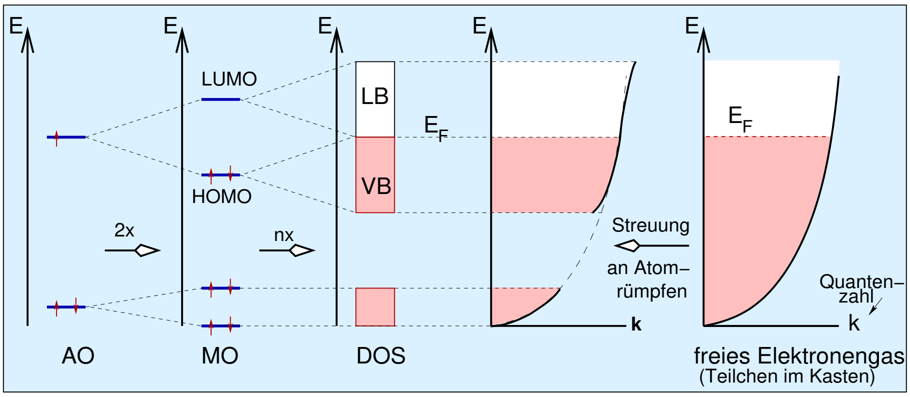
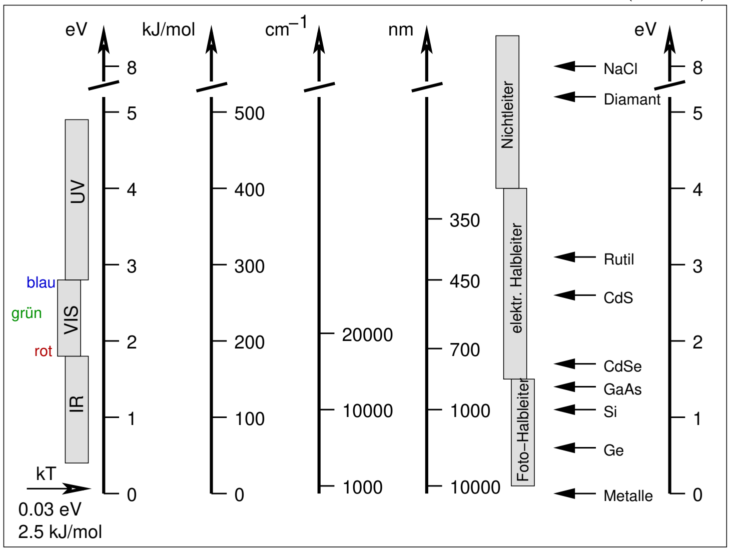
# 2.4. Halbleiter

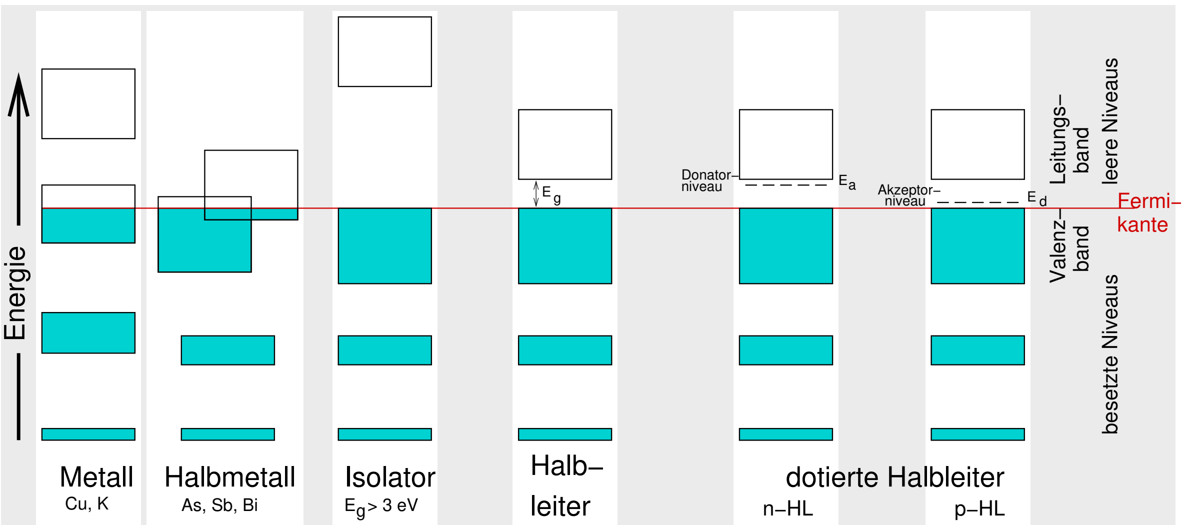
## 2.4.1. Zustandsdichten (vereinfachtes Bändermodell)




Bandstruktur, Zustandsdichte (DOS)




Energieskala und Bandlücken




| Konzentration v. Elektronen [$cm^{-3}$] | |
|---|---|
| As | $2\ 10^{20}$ |
| Sb | $5\ 10^{19}$ |
| Bi | $3\ 10^{17}$ |

| Bandabstand $E_g$ bei 0 K [eV] | |
|---|---|
| Diamant | 5.4 |
| $TiO_2$ | 3.03 |
| ZnO | 3.436 |
| AgCl | 3.2 |
| NaCl | 10 |

| Bandabstand [eV] | | Beweglichkeit [$cm^2$/Vs] bei 300K | |
|---|---|---|---|
| | | $e^-$ | Löcher |
| Si | 1.17 | 1350 | 480 |
| Ge | 0.744 | 3600 | 1800 |
| InP | 1.43 | | |
| GaAs | 1.53 | 8000 | 300 |
| Te | 0.33 | | |
| Se | 2.2 | | |
| PbSe | 0.163 | 1020 | 930 |

| $E_a$ in Si [eV] | |
|---|---|
| P | 0.045 |
| As | 0.049 |
| Sb | 0.039 |

| $E_d$ in Si [eV] | |
|---|---|
| B | 0.045 |
| Al | 0.057 |
| Ga | 0.065 |
| In | 0.016 |

vereinfachte Zustandsdichten verschiedener Festkörper