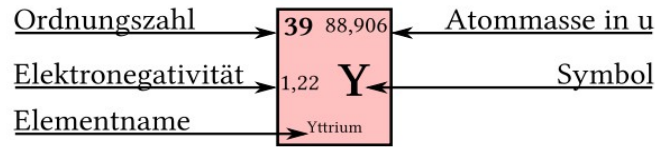


Periodensystem der Elemente

Alkalimetalle	Erdalkalimetalle	Halogene	Edelgase	Übergangsmetalle
Metalle	Halbmetalle	Nichtmetalle	Lanthanoide	Actinoide



IA																	VIIIA								
1 1,0079 H Wasserstoff																	2 4,0026 He Helium								
2 0,98 Li Lithium	IIA 4 9,0122 Be Beryllium																	3 0,93 Na Natrium	12 24,305 Mg Magnesium	III A 5 10,811 B Bor	IVA 6 12,011 C Kohlenstoff	V A 7 14,007 N Stickstoff	VIA 8 15,999 O Sauerstoff	VII A 9 18,998 F Fluor	10 20,180 Ne Neon
3 0,82 K Kalium	19 39,098 Ca Calcium	21 44,956 Sc Scandium	22 47,867 Ti Titan	23 50,942 V Vanadium	24 51,996 Cr Chrom	25 54,938 Mn Mangan	26 55,845 Fe Eisen	27 58,933 Co Cobalt	28 58,693 Ni Nickel	29 63,546 Cu Kupfer	30 65,39 Zn Zink	31 69,723 Ga Gallium	32 72,64 Ge Germanium	33 74,922 As Arsen	34 78,96 Se Selen	35 79,904 Br Brom	36 83,80 Kr Krypton								
4 0,82 Rb Rubidium	38 87,62 Sr Strontium	39 88,906 Y Yttrium	40 91,224 Zr Zirkonium	41 92,906 Nb Niob	42 95,94 Mo Molybdän	43 (97) Tc Technetium	44 101,0 Ru Ruthenium	45 102,91 Rh Rhodium	46 106,42 Pd Palladium	47 107,87 Ag Silber	48 112,41 Cd Cadmium	49 114,82 In Indium	50 118,71 Sn Zinn	51 121,76 Sb Antimon	52 127,60 Te Tellur	53 126,90 I Iod	54 131,29 Xe Xenon								
5 0,79 Cs Cäsium	56 137,33 Ba Barium	* *	72 178,49 Hf Hafnium	73 180,95 Ta Tantal	74 183,84 W Wolfram	75 186,21 Re Rhenium	76 190,23 Os Osmium	77 192,22 Ir Iridium	78 195,08 Pt Platin	79 196,97 Au Gold	80 200,59 Hg Quecksilber	81 204,38 Tl Thallium	82 207,2 Pb Blei	83 208,98 Bi Bismut	84 (209) Po Polonium	85 (210) At Astat	86 (222) Rn Radon								
6 0,7 Fr Francium	87 (223) Ra Radium	** **	104 (267) Rf Rutherfordium	105 (268) Db Dubnium	106 (271) Sg Seaborgium	107 (270) Bh Bohrium	108 (277) Hs Hassium	109 (276) Mt Meitnerium	110 (281) Ds Darmstadtium	111 (280) Rg Röntgenium	112 (285) Cn Copernicium	113 (287) Uut Ununtrium	114 (289) Uuq Ununquadium	115 (288) Uup Ununpentium	116 (289) Uuh Ununhexium	117 (291) Uus Ununseptium	118 (293) Uuo Ununoctium								

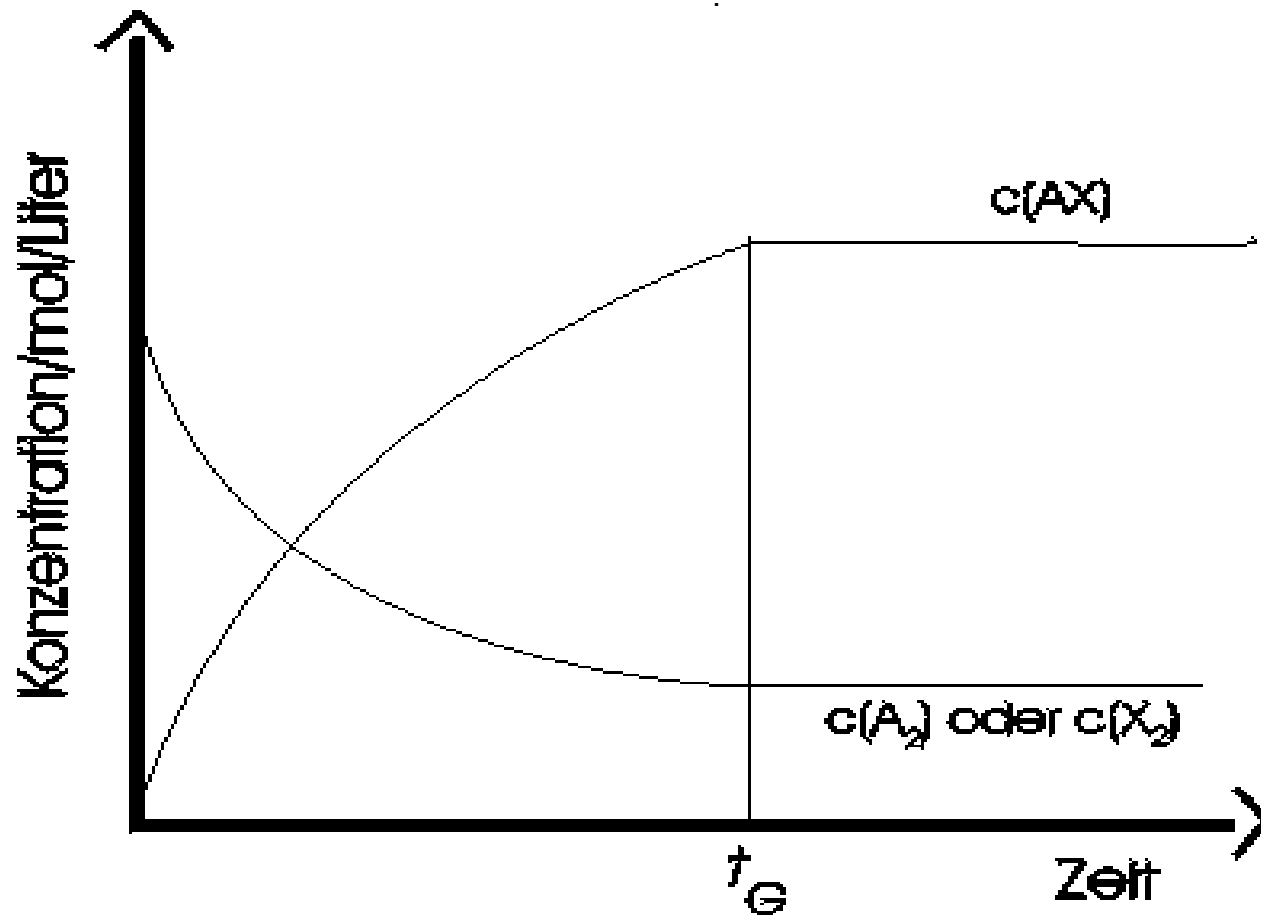
* Lanthanoide

57 138,91 La Lanthan	58 140,12 Ce Cer	59 140,91 Pr Praseodym	60 144,24 Nd Neodym	61 (145) Pm Promethium	62 150,36 Sm Samarium	63 151,86 Eu Europium	64 157,25 Gd Gadolinium	65 158,93 Tb Terbium	66 162,50 Dy Dysprosium	67 164,93 Ho Holmiun	68 167,26 Er Erbium	69 168,93 Tm Thulium	70 173,04 Yb Ytterbium	71 174,97 Lu Lutetium
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** Actinoide

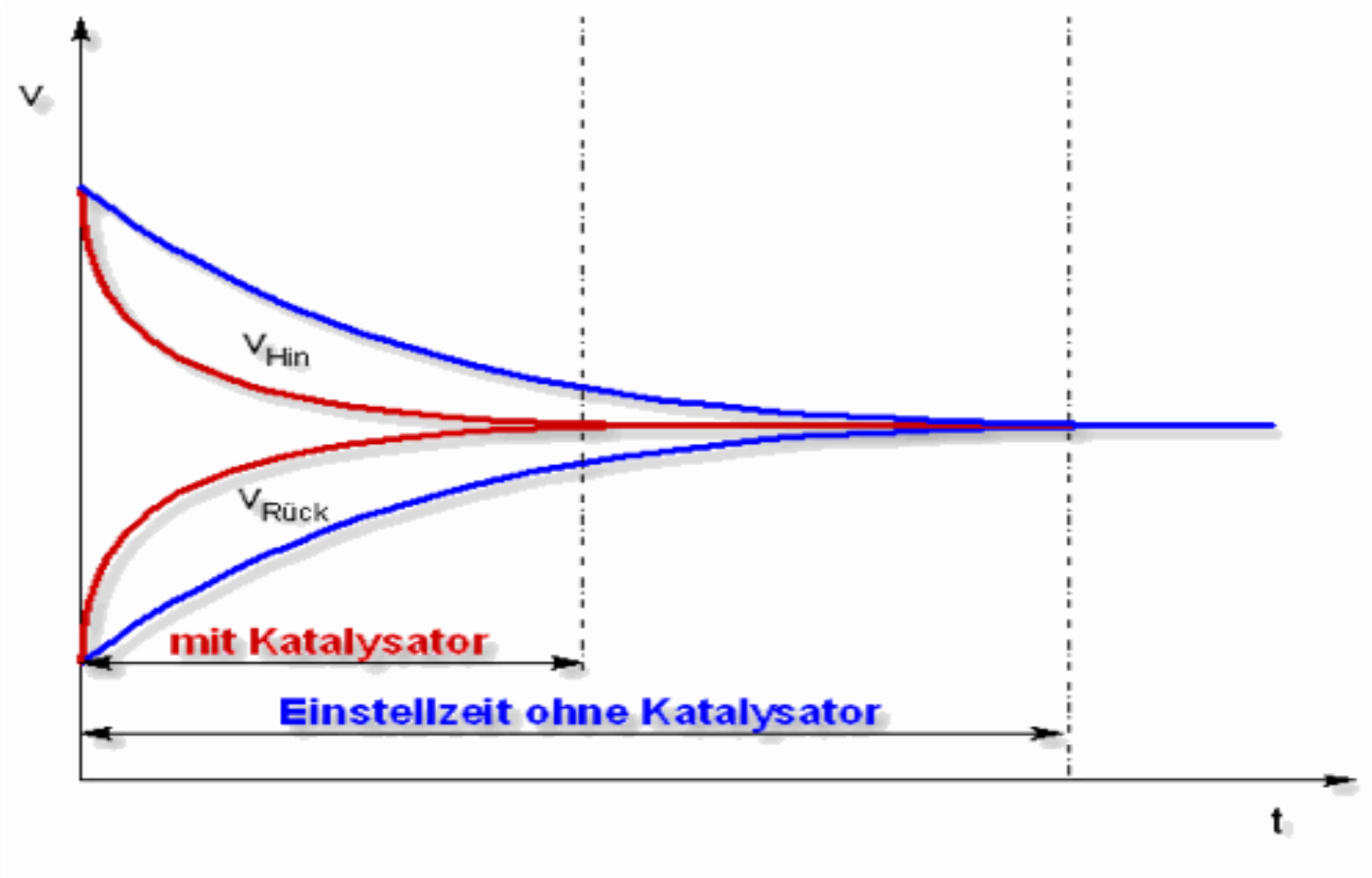
89 (227) Ac Actinium	90 232,04 Th Thorium	91 231,04 Pa Protactinium	92 238,03 U Uran	93 (237) Np Neptunium	94 (244) Pu Plutonium	95 (243) Am Americium	96 (247) Cm Curium	97 (247) Bk Berkelium	98 (251) Cf Californium	99 (252) Es Einsteinium	100 (257) Fm Fermium	101 (258) Md Mendelevium	102 (259) No Nobelium	103 (262) Lr Lawrencium
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Chemisches Gleichgewicht



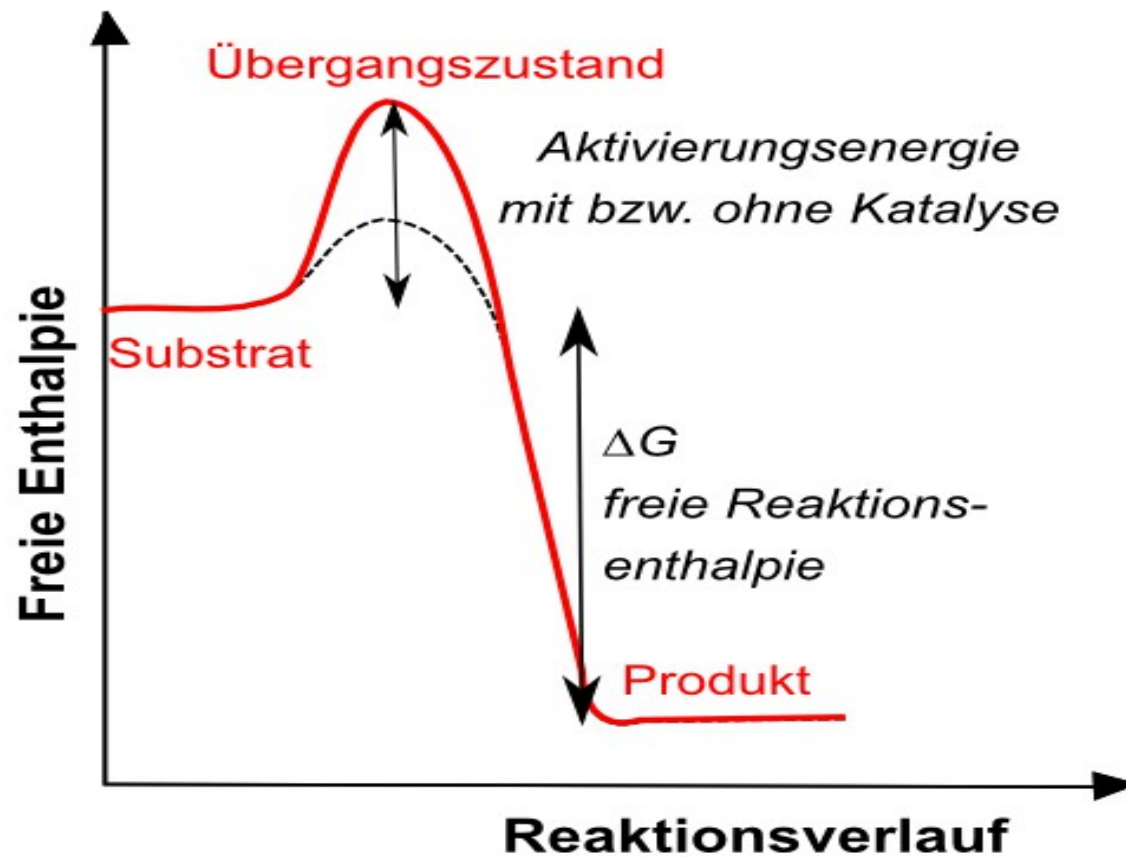
Katalysator

- Wirkprinzip (graphisch):



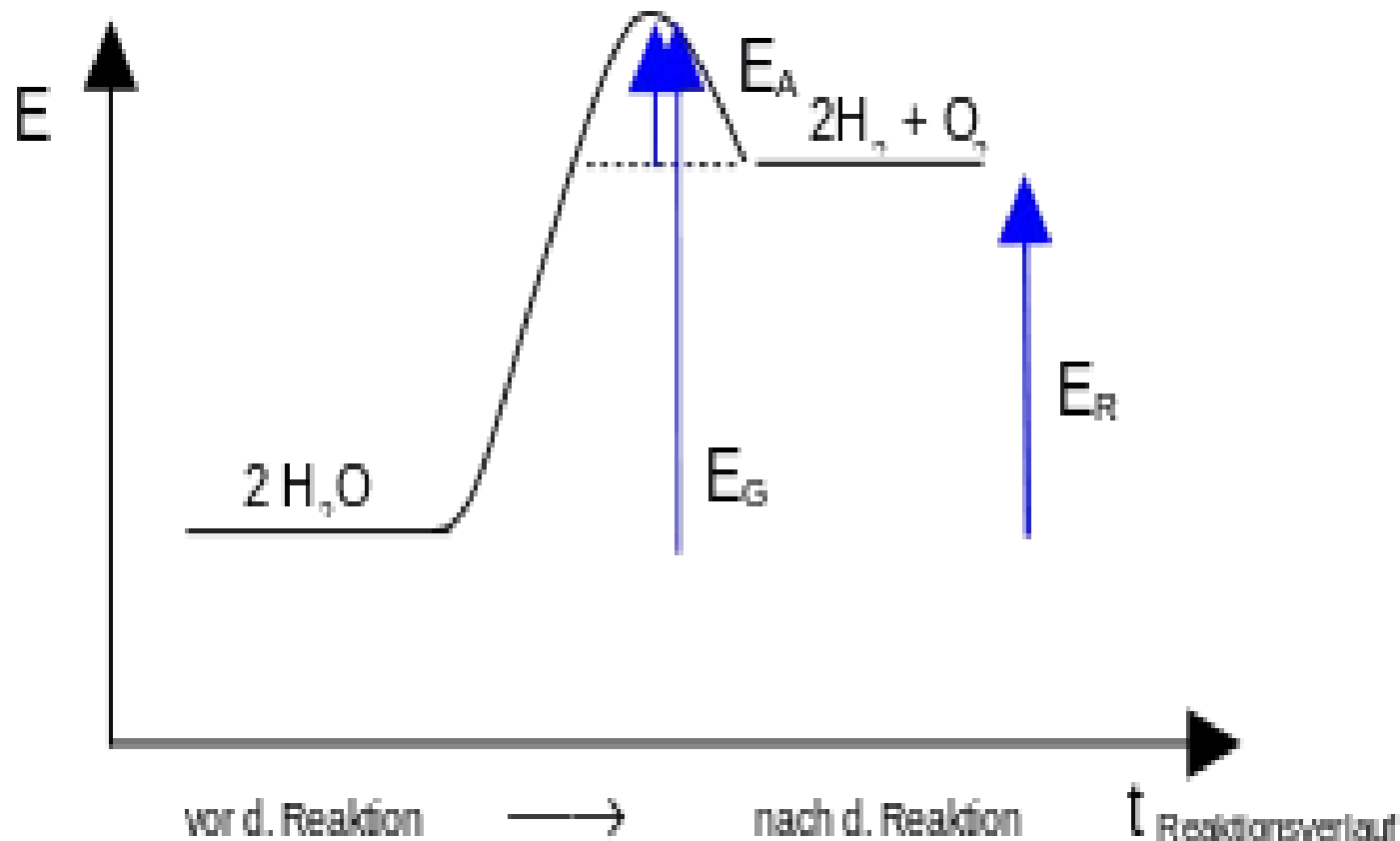
Katalysator

- Katalysator bei exothermen Reaktionen:



Katalysator

- Katalysator bei endothermen Reaktionen:



Stöchiometrisches Rechnen

- **Konstanten/Grundgleichungen:**

Konstanten univ. Gaskonstante $R = 8.314 \text{ [J mol}^{-1} \text{ K}^{-1}]$

Avogadro-Zahl $N_A = 6.022 \cdot 10^{23} \text{ [mol}^{-1}]$

Faraday-Konstante $F = 96485 \text{ [C mol}^{-1}]$

Umrechnungen Druck $1 \text{ atm} = 760 \text{ Torr} = 1.013 \text{ bar} = 101300 \text{ Pa}$

Temperatur $T \text{ [K]} = t \text{ [}^\circ\text{C]} + 273.15$

**Stoffmenge $n = m/M$ n Stoffmenge [mol]
 m Masse [g]
 M Molare Masse [g mol⁻¹]**

**$n = N/N_A$ N Teilchenzahl
 N_A Avogadro-Konstante**

Stöchiometrisches Rechnen

- Formeln:

$c = n/V$ **c** Stoffmengenkonzentration [mol l⁻¹] (früher: „Molarität“)
n Stoffmenge gelöster Stoff [mol] **V** Volumen Lösung

$X = m_i/V(l)$ **c*** Massenkonzentration von **i** [g l⁻¹]
m_i Masse von **i** [g]
V(l) Volumen Lösung [l]

$p V = n R T$ **p** Druck [Pa]
V Volumen [m³]
n Stoffmenge [mol]
T Temperatur [K]
R univ. Gaskonstante [J mol⁻¹ K⁻¹]