

Ergebnisse einiger Klausuren

A) Staatsexamensklausur 2009

- (1) (i) $\Delta T = -149 \text{ K}$ $Q = -249.9 \text{ J}$
(ii) $\Delta T = -149 \text{ K}$ $Q = -949.7 \text{ J}$
(iii) $\Delta T = +31.2 \text{ K}$ $Q = 0 \text{ J}$
(iv) $\Delta T = 0 \text{ K}$ $Q = -138.6 \text{ J}$
- (3) (ii) $\eta = \frac{|\sum W_i|}{\sum Q_i > 0} = \frac{785.3 \text{ J}}{4520.4 \text{ J}} = 0.174$
- (5) (iii) 1. $\Delta E(t = 0 \text{ s}) = 0.0887 \text{ V}$
 $\Delta E(t = 600 \text{ s}) = 0.0705 \text{ V}$
 $\Delta E(t = 1500 \text{ s}) = 0.0607 \text{ V}$
2. $t_{max} = 96484 \text{ s} = 26.8 \text{ h}$
- (6) (ii) $\frac{N_2}{N_1}(T = 0 \text{ K}) = 0$
 $\frac{N_2}{N_1}(T = 298 \text{ K}) = 3.18 \cdot 10^{-11}$
 $\frac{N_2}{N_1}(T = 773 \text{ K}) = 8.98 \cdot 10^{-5}$
 $\frac{N_2}{N_1}(T \rightarrow \infty \text{ K}) = 1$
(iii) $\langle u^2 \rangle^{0.5}(T = 298 \text{ K}) = 515 \text{ m/s}$
 $\langle u^2 \rangle^{0.5}(T = 773 \text{ K}) = 829.5 \text{ m/s}$

B) Klausur SoSe 2011

- (1) 1.2. (i) $\eta = \frac{T_w - T_k}{T_w} = 0.185$
(ii) $\eta = \frac{|\sum W_i|}{\sum Q_i > 0} = \frac{515 \text{ J}}{5225 \text{ J}} = 0.0986$
- 1.3. $\Delta_R H^* = 15504 \text{ J/mol}$
- (2) 2.1. (i) $k = 2.545 \cdot 10^{-5} \text{ s}^{-1}$
(ii) $k = 4.861 \cdot 10^{-3} \text{ l} \cdot \text{mol}^{-1} \cdot \text{s}^{-1}$
- 2.2 $E_A = 51.16 \text{ kJ/mol}$
- (3) 3.1. $\Delta E(t = 0 \text{ s}) = 0.1272 \text{ V}$
 $\Delta E(t = 1800 \text{ s}) = 0.05984 \text{ V}$
 $\Delta E(t = 3600 \text{ s}) = 0.05085 \text{ V}$
 $t_{max} = 96484 \text{ s} = 26.8 \text{ h}$

3.2. $m_{Cu^{2+}} = 1.45 \cdot 10^{-14} \text{ mol/kg}$

$m_{Pb^{2+}} = 249.5 \text{ mol/kg}$ d.h. komplett löslich wenn es nicht vorher wegen der Löslichkeitsgrenze des Bleisalzes ausfällt

(4) 4.1. $\frac{N_2}{N_1}(T = 293 \text{ K}) = 2.88 \cdot 10^{-9}$

$$\frac{N_2}{N_1}(T = 6273 \text{ K}) = 0.399$$

4.2. $U = 3.68 \text{ V}$

C) Nachklausur SoSe 2011

(1) 1.2. (ii) a) $T = -0.454 \text{ °C}$

b) $T = -0.00493 \text{ °C}$

1.3. $\Delta_R H^* = -26431 \text{ J/mol}$

(2) 2.1. (i) $k = 1.111 \cdot 10^{-4} \text{ mol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$

(ii) $k = 2.31 \cdot 10^{-2} \text{ s}^{-1}$

(3) 3.1. $\frac{\Lambda_1}{\Lambda_2} = \frac{\alpha_1}{\alpha_2} = 0.1046$ $\frac{\kappa_1}{\kappa_2} = 10.46$

3.2. Cu^{2+} : $m_{H^+} = 8307 \text{ mol/kg}$, d.h. komplett unlöslich!

Pb^{2+} : $m_{H^+} = 6.329 \cdot 10^{-5} \text{ mol/kg}$ $\Rightarrow \text{pH} = 4.199$

(4) 4.2. $\lambda = 4.046 \text{ }\mu\text{m}$