
С Новым годом!
Пусть новый год приносит только счастье!
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1a) fluide, wahrscheinlich flüssig

"super - Hg"

b) $^{277}_{112}Cn$, $Z = 112$, $v = 2$ a.u

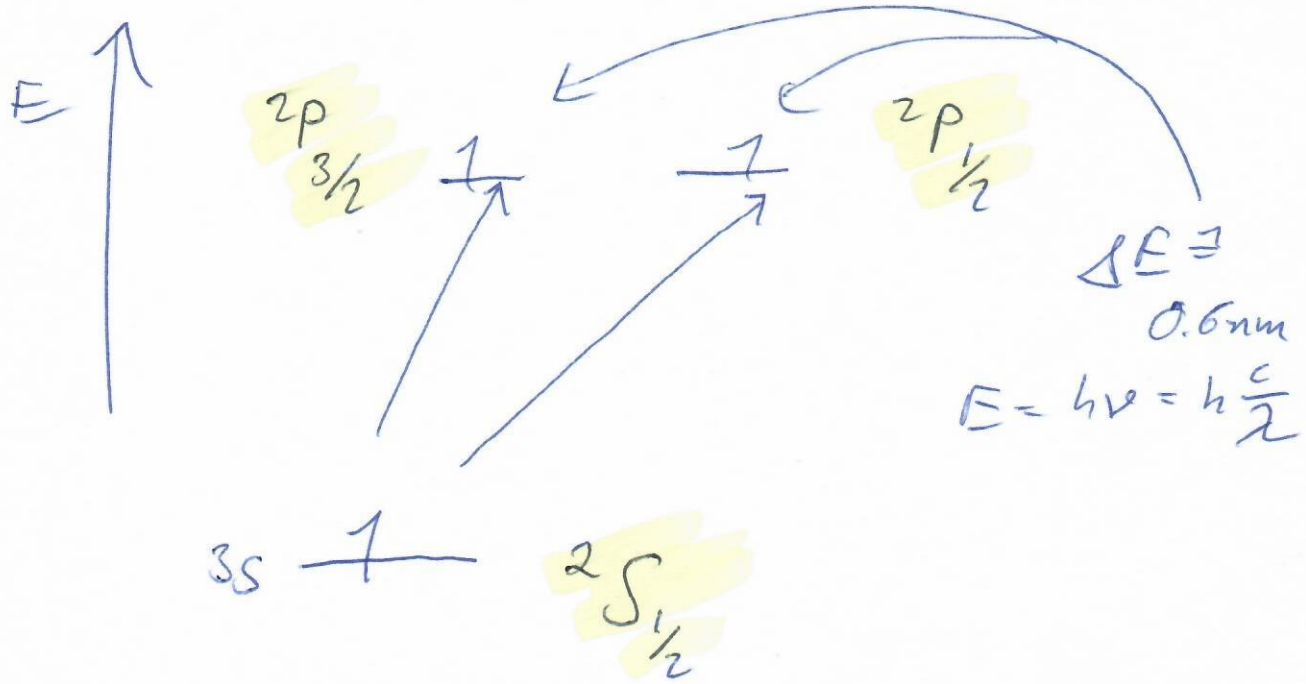
$$m = \frac{m_0}{\sqrt{1 - \left(\frac{112}{137}\right)^2}} = 1.74\ m_0$$

$$\frac{r(1s)_{n-r}}{r(1s)_r} = \frac{m_r}{m_0} = 1.74$$

$$r(1s)_{rel} = 0.58\ r_{n-r}$$

c) $m_{rel} = 1.74\ m_0$

2)



3) $^{232}_{90}Th + {}^{1}_{0}n \rightarrow {}^{233}_{90}Th \xrightarrow{\beta^-} {}^{233}_{91}Pa$

$^{233}_{91}Pa \xrightarrow{\beta^-} {}^{233}_{92}U$

4) $UO_2 + 4\,HF \longrightarrow UF_4 + 2H_2O$

$UF_4 + F_2 \longrightarrow UF_6$

(oder ClF_3)

5) $^{20}_{10}Ne + {}^{2}_{1}D \longrightarrow {}^{18}_{9}F + {}^{4}_{2}He$

6) alkalische Hypochlorit-Lösung.

7) $\Delta t_g = E_g \, b$ $\qquad E_g = 1.86 \frac{K\,kg}{mol}$

$\Delta t_g = 5\,K$

$b = \frac{\Delta t_g}{E_g} = \frac{5}{1.86} \frac{K\ mol}{K\ kg} = 2.69 \frac{mol}{kg}$

$M\left(\text{Harnstoff } (NH_2)_2CO\right) = 60 \frac{g}{mol} \Rightarrow 0.16\,kg$

8) $pV = nRT$

$V = \frac{nRT}{p}$

$n = 1\ mol$

$T = 273\ K$

$p = 5 \times 10^4\ Pa$

$V = 0{,}045\ m^3 = 45\ L$

9) $\Delta H_{verd} = b.p. \cdot \Delta S_{verd}$

$\Delta S_{verd} \approx 88\ J\ K^{-1}\ mol^{-1}$

$\Delta H_{verd} = 26\ \frac{kJ}{mol}$

10) 64

11) KCN

As_2O_3

$H_2NC(O)NH_2 \,/\, H_2O$

12) $\alpha - Po$

13) $\Delta H^\circ_f(NO_2, g) > 0$ endotherm

Dieselmotor ist heißer als Benzinmotor

14) Cu (ohne Ce), Tl, Ba, B (als BO_2)

15) s (sphärisch)

16) P $^4S_{3/2}$

Ce $^2P_{3/2}$

Ar $^1S_0$

17) $Li - Li \longleftrightarrow Li^{\oplus}\ |Li^{\ominus} \longleftrightarrow {}^{\ominus}Li|\ Li^{\oplus}$

18.) Fermi O

Coulomb Minimum

19) $h_1 = \frac{1}{\sqrt{2}}(s+p)$ $h_2 = \frac{1}{\sqrt{2}}(s-p)$

20) Be $2s^2$

Beide Elektronen im 2s-Orbital mit α- und β-Spin:

$$\Psi = \frac{1}{\sqrt{2}} \begin{vmatrix} 2s(1)\alpha(1) & 2s(2)\alpha(2) \\ 2s(1)\beta(1) & 2s(2)\beta(2) \end{vmatrix}$$

$$= \frac{1}{\sqrt{2}} \Big[2s(1)\alpha(1)\, 2s(2)\beta(2) - 2s(1)\beta(1)\, 2s(2)\alpha(2) \Big]$$

21) a) s, p

b) s, d

22) $^1\Sigma_g$ π^* ↑ ↑ π ↑↓ ↑↓

23) $^{210}_{84}Po \longrightarrow {}^{206}_{82}Pb + {}^{4}_{2}He$

Neutronen-Quelle

$^{9}_{4}Be + {}^{4}_{2}He \longrightarrow \{{}^{13}_{6}C^*\} \longrightarrow {}^{12}_{6}C + {}^{1}_{0}n$

24) $(-\frac{1}{2})$ $|N^{*} \doteq O^{*}|$ $(+\frac{1}{2})$

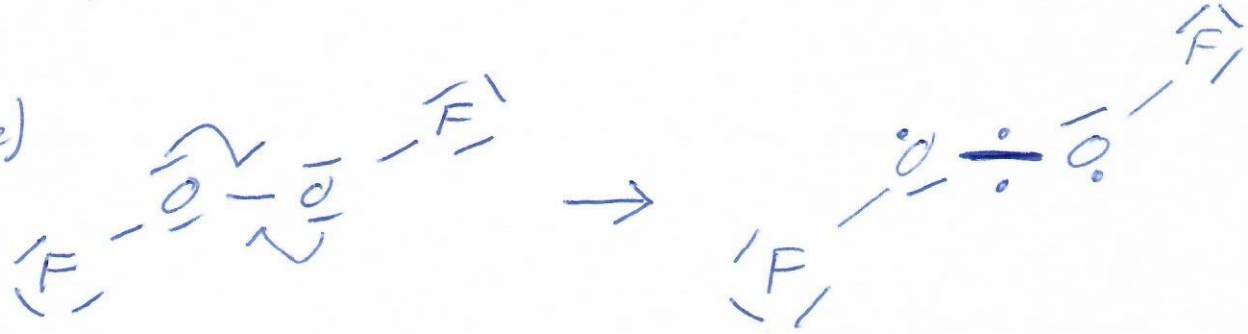
25) H_2 $b = 1$

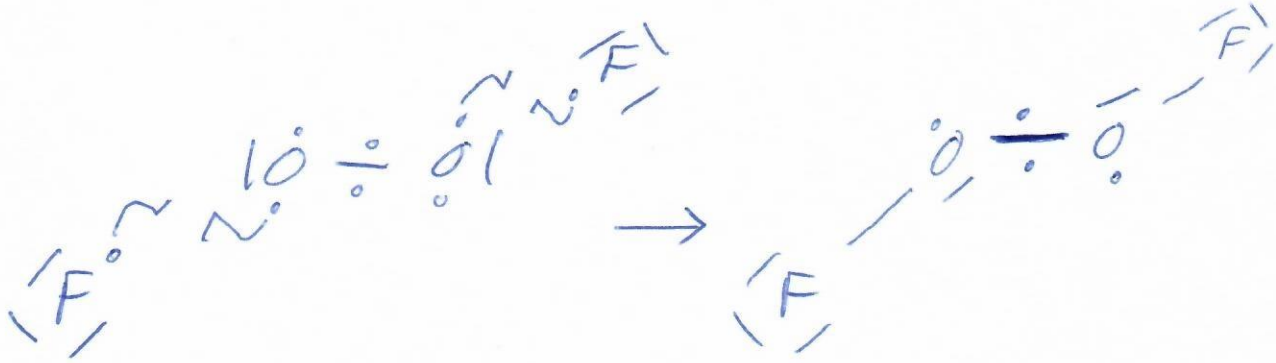
H_2^+ $b = \frac{1}{2}$

Elektronen korrelation, sharing penetration

26) STO: $e^{-\alpha r}$

GTO: $e^{-\alpha r^2}$

27) a) 

b) 

28) ^3p $\overline{|O\cdot}$ ^1D $\overline{|O|}$

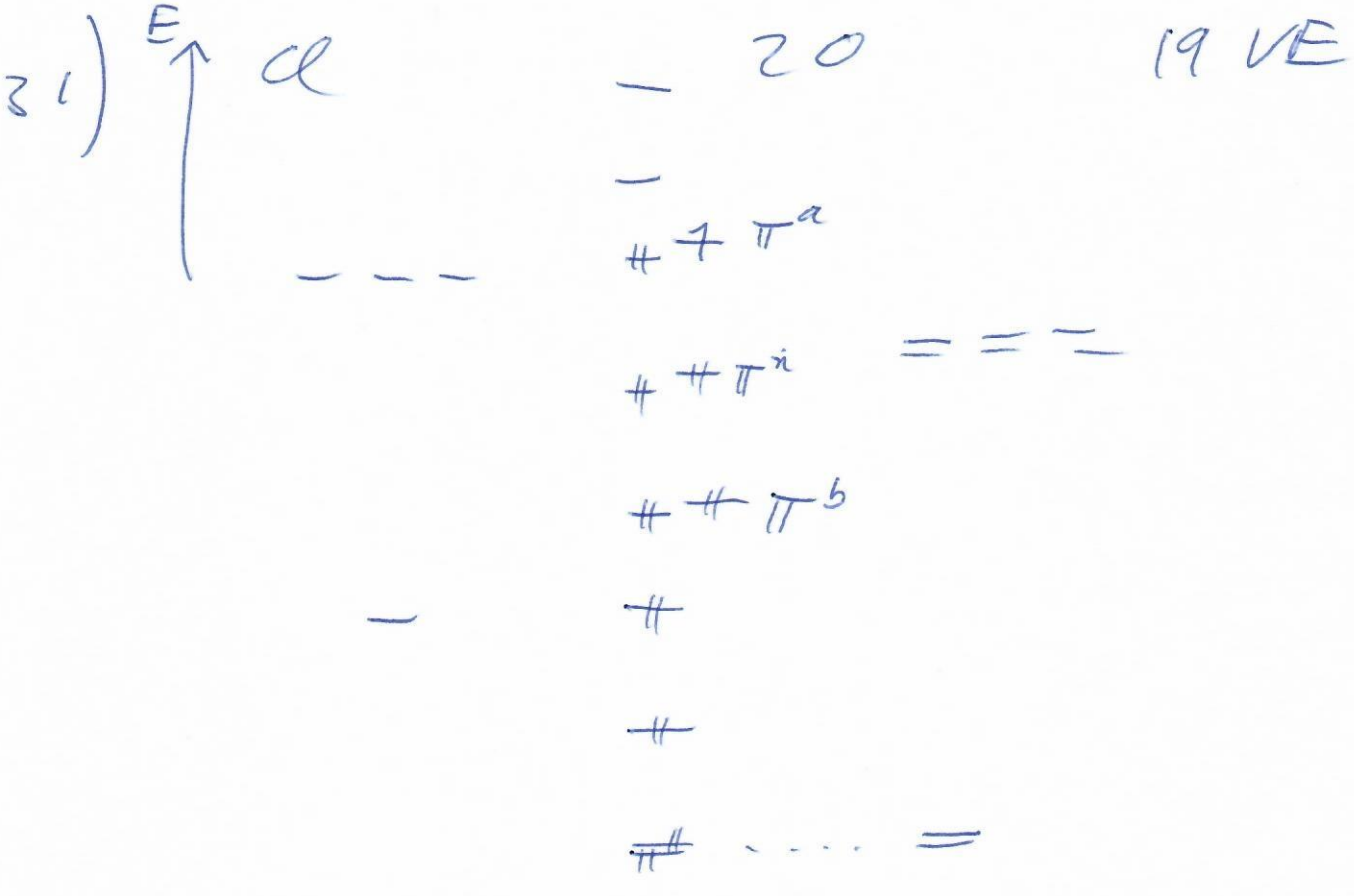
29) $m = 85\ kg$ $\quad g = 9.81\ \frac{m}{s^2}$

$F = m \cdot g$

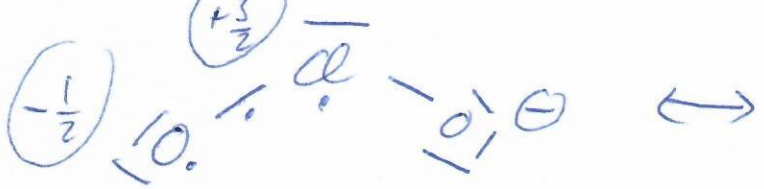
$F = 834\ \frac{kg\ m}{s^2}$

$F \rightarrow 824\ N$

30) $w_i = \frac{c_i^2}{\sum_i c_i^2}$

31) 

$b_{MD} = \frac{8-3}{4} = \frac{5}{4}$



$b_{VB} = \frac{1+1.5}{2} = 1,25$