jupyter

December 14, 2024

[1]:
```
from sympy import *
init_printing(use_latex="mathjax")
import numpy as np
import scipy.constants as c
from IPython.display import display as print
```

[2]:
```
# Nr.1
Na = 22.990e-3 # kg/mol
Cl = 35.453e-3 # kg/mol
rho = 2165 # kg/m^3
z = 4

g = (z * (Na + Cl) / (c.N_A * rho))**(1/3)

float(g)
```

[2]: $5.63890221000711 \cdot 10^{-10}$

[3]:
```
# Nr.5
T_M = (933,9e-4) # (K,1)
T_R = (300,2.1e-11) # (K,1)

Delta = lambda T,c_V: c.Boltzmann*T * log(1/c_V - 1) / c.e # eV
print(Delta(*T_R),Delta(*T_M))
```

0.635610158577613

0.563780149229782

[4]:
```
# Nr.6
# (a)
E = lambda m,lamb: (sqrt(m**2 * c.c**4 + c.h**2 * c.c**2 / lamb**2) - m*c.c**2)
E_e, E_n = E(c.m_e,0.2e-9), E(c.m_n,0.2e-9)
print(E_e / c.e, E_n / c.e)

# (b)
T = lambda E: 2/3 * E/c.Boltzmann
print(T(E_e)*1e-5, T(E_n))
```

37.6016328119143

0.0204510378765603

2.90899219577155

158.216293095368