(a) Avogadro's number.

$$N_A = 6.02 \times 10^{23}\,\text{atoms/mole}$$

Hence

$$\frac{N}{V} = \frac{8.96\,\text{g/cm}^3 \times (100\,\text{cm/meter})^3}{63.5\,\text{g/mole}} \times 6.02 \times 10^{23}\,\text{mole}^{-1} = 8.49 \times 10^{28}\,\text{meter}^{-3}$$

Each atom contributes $d = 1$ electrons.

$$\rho = \frac{Nd}{V} = 8.49 \times 10^{28}\,\text{meter}^{-3}$$

Then for

$$\hbar = 1.05 \times 10^{-34}\,\text{joule second}$$
$$m = 9.11 \times 10^{-31}\,\text{kilogram}$$

we have

$$E_F = \frac{\hbar^2}{2m}\left(3\pi^2\rho\right)^{2/3} = 2.34 \times 10^{-19}\,\text{joule}$$

Convert to electron volts.

$$E_F = \frac{2.34 \times 10^{-19}\,\text{joule}}{1.60 \times 10^{-19}\,\text{joule/electronvolt}} = 1.46\,\text{electronvolt}$$

(b) Not relativistic.

$$v = \sqrt{2E_F/m} = 717\,\text{kilometer/second}, \quad v \ll 300{,}000\,\text{kilometer/second}$$

(c) Boltzmann constant.

$$k_B = 1.38 \times 10^{-23}\,\text{joule/kelvin}$$

Hence

$$T_F = \frac{E_F}{k_B} = 16{,}900\,\text{kelvin}$$

(d)

$$P = \frac{\left(3\pi^2\right)^{2/3}\hbar^2}{5m}\rho^{5/3} = 3.80 \times 10^{10}\,\text{newton/meter}^2$$