Quiz 16

Sodium
Sodium atoms have a mass of 23 atomic units (one atomic unit is 1.7×10^{-27} kg)
The density of metallic sodium is 970 kg/m^3.

Magnesium
Magnesium atoms have a mass of 25 atomic units
The density of metallic magnesium is 1740 kg/m^3.

Aluminum
Aluminum atoms have a mass of 27 atomic units
The density of metallic aluminum is 2700 kg/m^3.

Choose one of the three metals listed above.

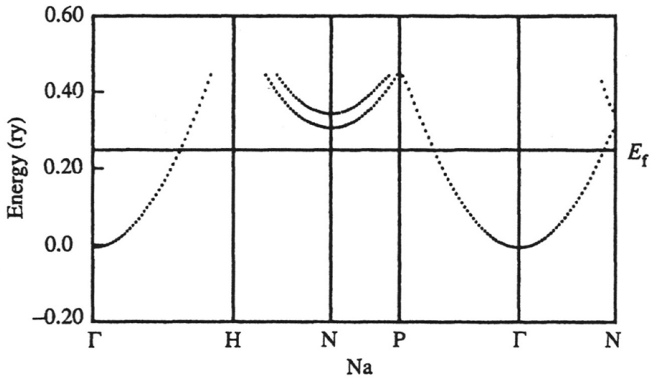
a) How many "free electrons per unit volume" do you expect?

b) Assuming a free electron model, calculate k_F for your material.

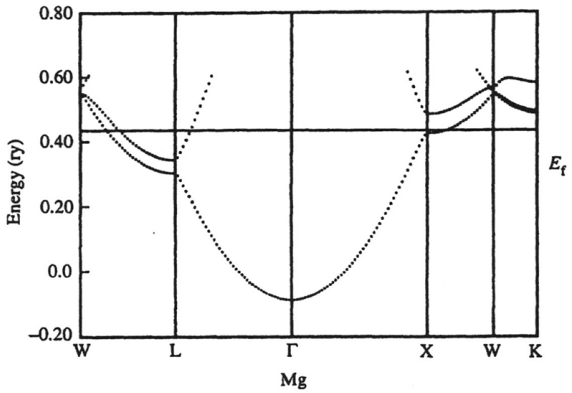
c) Calculate E_F for your material.

The “simple” metals fit the free electron model

Sodium



Magnesium



Aluminum