Keystone: Chapter 7

A hot bar of iron glows a dull red. Using our simple model of a solid, answer the following questions, explaining in detail the processes involved. The mass of one mole of iron is 56 grams.

1) What is the energy of the lowest-energy spectral emission line? Give a numerical value.

2) What is the approximate energy of the highest-energy spectral emission line? Give a numerical value.

3) What is the quantum number of the highest-energy occupied state?

4) Predict the energies of two other lines in the emission spectrum of the glowing iron bar.

(Note: our simple model is too simple—the actual spectrum is more complicated. However, this simple analysis gets at some important aspects of the phenomenon.)