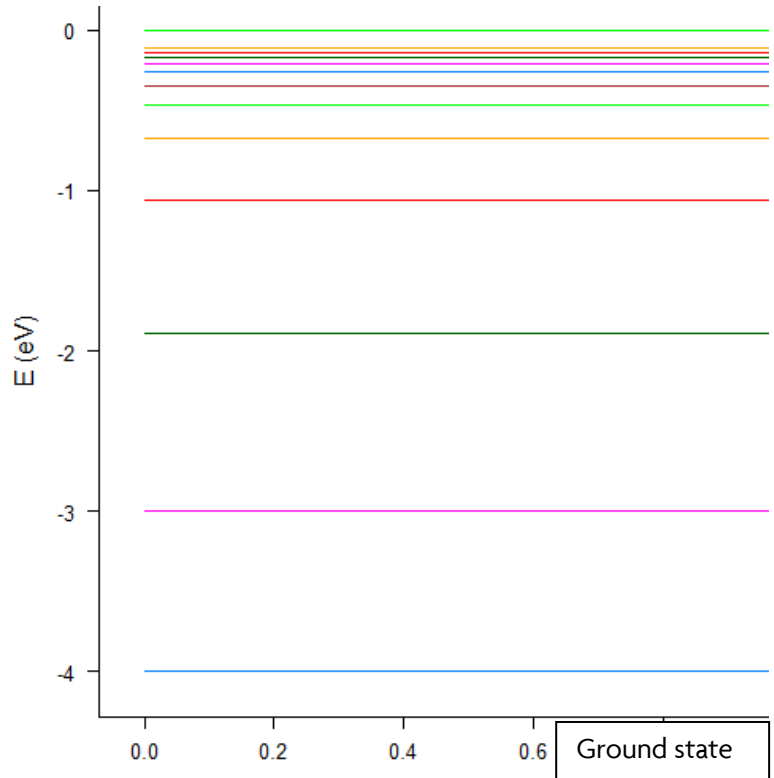


1. A substance has the energy structure to the right.
 - a. How much energy does it take to ionize one atom of this substance if it is initially in the ground state?
 - b. What temperature (approximately) will the substance need to be at for us to expect the -3eV energy level to be populated?



2. When current passes through a forward biased pn-junction (diode), where does the energy from the electrons dropping through the bandgap go? (Yes, yes everything eventually goes to heat and thermal vibrations but where does it go on its way there?)
3. A pn-junction (diode) has a bandgap of 2.3V. If the device's jacket is clear glass, what would you notice about the device as current passes through it (in the forward biased direction)? Your answer should be specific and quantitative.
4. Why doesn't a positively ionized donor atom contribute to conduction in an n-type semiconductor?