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CHEM 6004

How Cool Is That?

1. The spectra region for Plank’s Blackbody Law at 300 K is at 5000 nm in the infrared region. The actual wavelength is 9.633 micrometer. This is calculated by (2.898\*10^-3)/300k.
2. Ideal properties that allow proper cooling for a rooftop will be material mixture that reflects more energy than is absorbed by the sun.
3. The emissivity/absorptivity of an ideal cooling material that overlaps with the Blackbody spectrum at 300k would be a material that reflects in the mid IR, the material could absorb anywhere but mid IR.
4. The origin of radiation flowing from the Sun to the Earth’s atmosphere occur as a shortwave light and UV energy. When it reaches the Earth’s atmosphere some is reflected back and some is absorbed at the surface. But the Earth is much cooler than the Sun because the atmosphere stores more energy incoming from the Sun than the actual Earth’s surface. The sky radiates because every chemical has its own vibrational energy, and the atmosphere is a mixture of different chemicals.