(c) Rank the following spectra from having the least to the most number of absorption lines[2]; clearly indicate ties, if any. Then briefly explain the reasoning for your ranking.

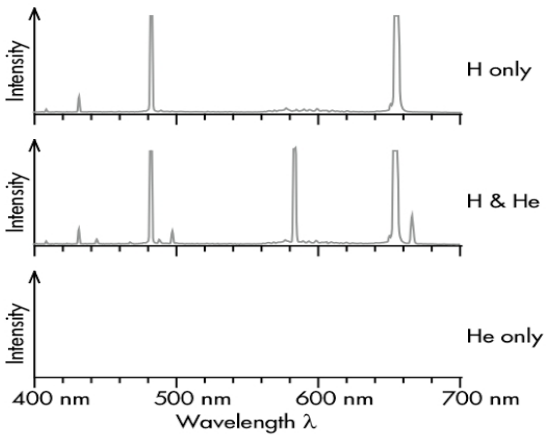
(A) The sun, observed from a spacecraft in orbit around Earth.
(B) The sun, observed from a telescope at sea level.
(C) Light from an incandescent light bulb, across the room.

_____ _____ _____
(least lines) (most lines)

Explanation:

Emission Spectra

3. The (simplified) intensity versus wavelength graph of a sample that contains only hydrogen (H) atoms is shown with the graph of a sample that contains both hydrogen and helium (He) atoms. Carefully note the wavelength values of the peaks in these graphs.



(a) Sketch in the peaks of a sample that contains *only* He atoms.

(b) (Clearly circle your answer.)
According to Kirchhoff's laws, these spectra are produced by
[a hot, dense object
| hot, diffuse gas atoms
[blackbody radiation passing through cool, diffuse gas atoms].

(c) Briefly explain your answer to (b).

Explanation:

---

[2]Adapted from Adams, Prather, and Slater, *Lecture-Tutorials for Introductory Astronomy, 1/e*, Addison-Wesley, 2005, pp. 43-44.