

10.4: Elemental Data

Elemental Data

When you look at the spectrum of sunlight, you will see a blend of colors. This is called a continuous spectrum. This is like a rainbow, produced when sunlight passes through raindrops, which act as prisms.



A rainbow. Raindrops act as prisms, breaking the sunlight into its component colors. Rainbow above Kaviskis Lake by Arz is licensed under [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)



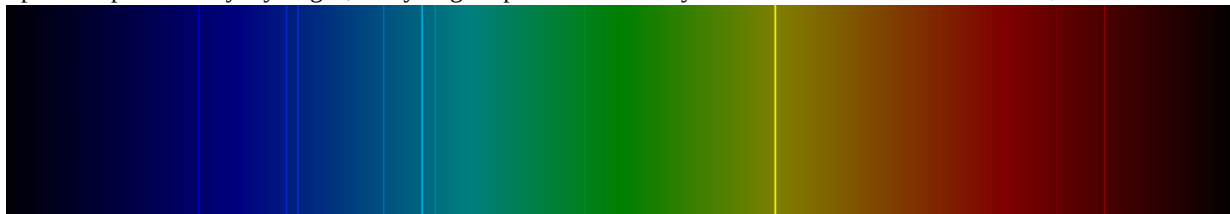
A continuous spectrum. This is much like the rainbow. Spectral-lines-continuous by Stkl is in the [Public Domain](#)

The science of spectroscopy starts in the lab, where scientists observe the spectra of different elements with the spectroscope. What scientists noted is that each element or compound have their own signature spectrum. So, when observing a star, astronomers use a spectroscope to definitively determine what elements make up that star, among other things about the star.

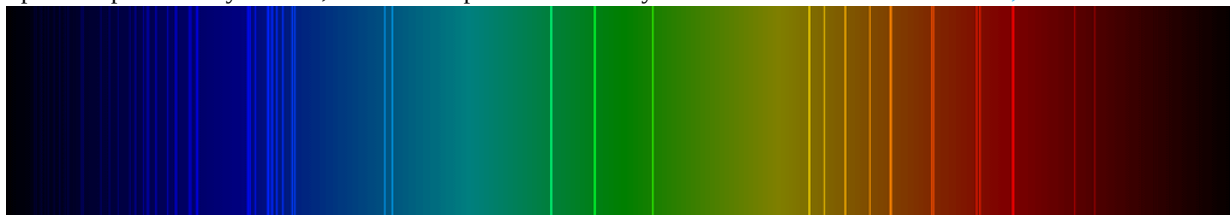
Compare the spectra of hydrogen, helium, oxygen, and neon, below. Look at the lines; this is the key to determine which element's spectrum you are observing. Each spectrum is specific to that element. It is like fingerprints; no two are alike.



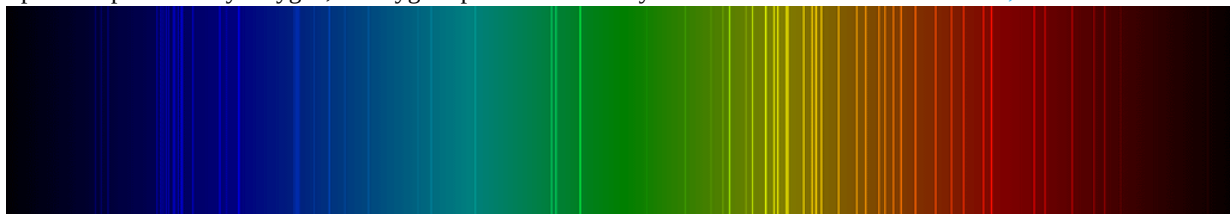
Spectrum produced by Hydrogen, H Hydrogen spectrum visible by McZusatz is in the [Public Domain, CC0](#)



Spectrum produced by Helium, He Helium spectrum visible by McZusatz is in the [Public Domain, CC0](#)

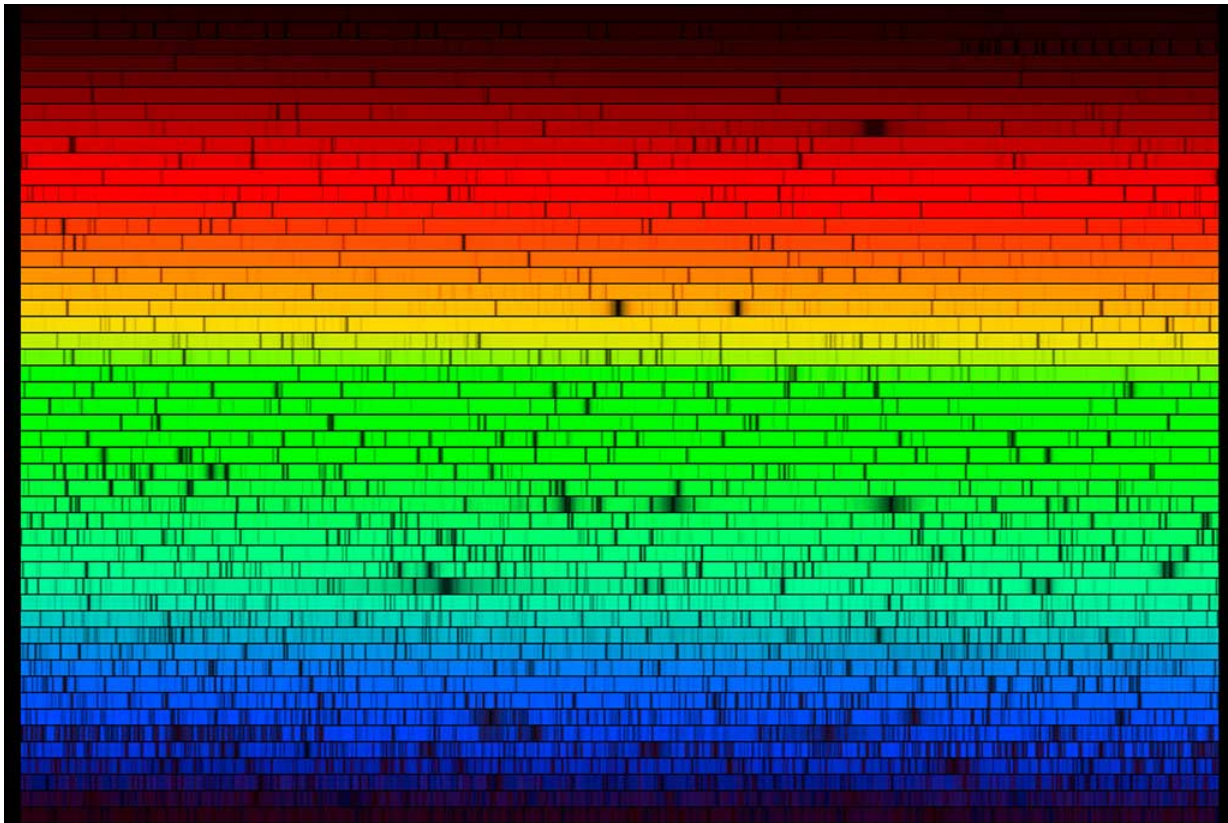


Spectrum produced by Oxygen, O Oxygen spectrum visible by McZusatz is in the [Public Domain, CC0](#)



Spectrum produced by Neon, Ne Neon spectrum visible by McZusatz is in the [Public Domain, CC0](#)

When one captures the Sun's spectra, it includes all of the elements and compounds found in the Sun.



The Sun's Spectrum. This image tells astronomers a lot about our star, as spectra can about other stars. Included in the stellar spectral message is the star's make-up and star type. [The barcode of the Sun](#) by ESO/José Francisco is licensed under [CC BY 4.0](#)

Astronomers employ stellar spectroscopy to study stars, which allows them to determine many of the physical and chemical properties of the stars and other objects they study in space. ⁽¹⁾

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