Hydrogen

Helium

Lithium

Beryllium

Boron

Oxygen

Sodium

Mercury

Aluminum

Magnesium

Use the spectra on the previous pages to identify the spectra below:

A

B

C

D

E

Identify the following spectra:
They might be:

- a mixture of spectra
- a single element red—shifted
- a single element blue-shifted.

W

X

Y

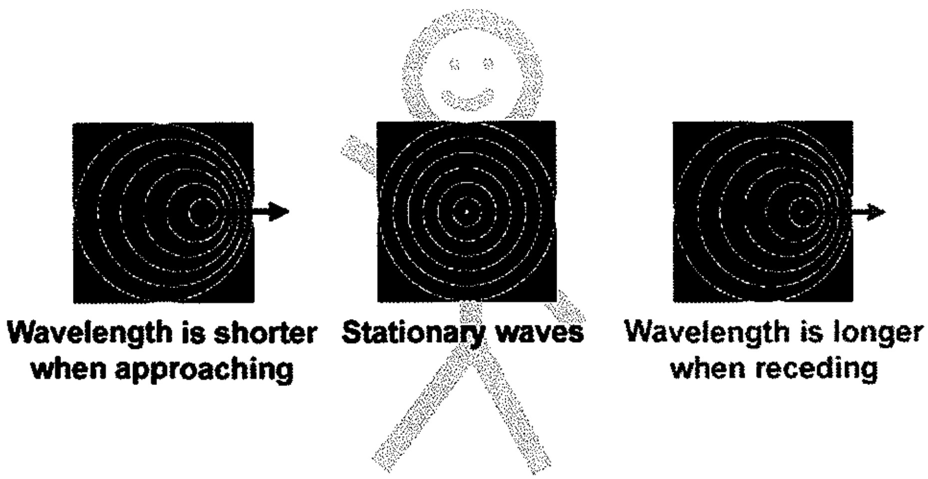
Z

Key to identification of spectra:

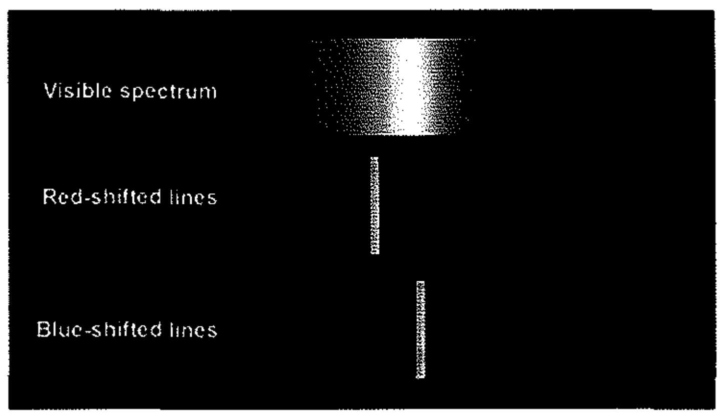
A: Helium
B: Beryllium
C: Magnesium
D: Hydrogen
E: Aluminum

W: Beryllium and Lithium
X: Hydrogen and Helium
Y: Hydrogen Red-shifted
Z: Hyfrogen Blue-shifted.

Doppler Effect
Red Shift and Blue Shift



Redshifts, Blueshifts



Stars emit light. Using a prism or a diffraction grating, we can spread this light out into a spectrum. If we look at the spectrum of the Sun or any other star, we see not only the rainbow of colors from red, orange and yellow through to violet, but also a distinctive pattern of dark lines. At certain wavelengths, light will be ABSORBED by chemical elements like hydrogen, helium, calcium, and iron. These wavelengths are based on atomic physics and can be measured extremely accurately in a laboratory on Earth.
If a star is moving towards us, the whole pattern of the spectrum gets shifted to shorter wavelengths, i.e. towards the blue end of the spectrum. This is a BLUESHIFT, and we can measure it very accurately by comparing the apparent wavelengths of the spectral lines with the known laboratory wavelengths. If the star is receding, the pattern moves to longer, redder wavelengths, and this is a REDSHIFT. "Blueshifts come, and redshifts go, and that's pretty much everything you need to know."

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