

Physics 1200

Balmer Series and the Ground State of the Hydrogen Atom

In your lab manual under Measurements, part (1) has you measure the angular positions of the visible spectral lines of helium. They ask for eight, but indicate that seven will be fine. See figure 2 in your manual for an abbreviation of colors along with their respective known wavelengths. Violet could not be found so we begin with Blue Violet.

Each spectral line will have three photos associated with it. The first is looking through the eyepiece. The arrow in the photo points to the center of the crosshairs and indicates which color is being measured. The next picture is a photo of the instrument's scale so that the viewer may determine the location of the zero tick mark (on the sliding scale). The third photo is a close-up of the sliding scale with the camera lens above the tick marks of interest. **Each Vernier scale photo serves a purpose.** The *first* photo allows the viewer to establish where the zero is located, while the *second* photo allows the viewer to accurately determine which tick mark on the sliding scale lines up with the stationary scale.

As a side note, the camera causes some lines to appear bent. Also, sometimes colors look distinct with the naked eye but appear very similar in these photos. One last thing, if you notice more lines than in figure 2, it is glare from the camera lens. Of course, none of this affects your measurements.

Photo 1 of 3 for helium blue-violet.

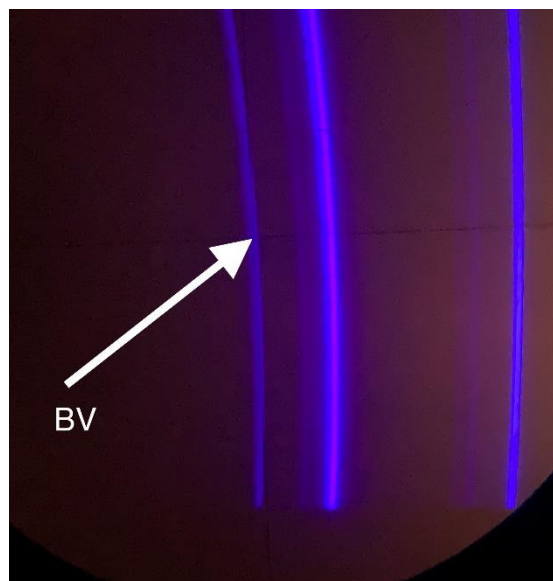


Photo 2 of 3 for helium blue-violet.

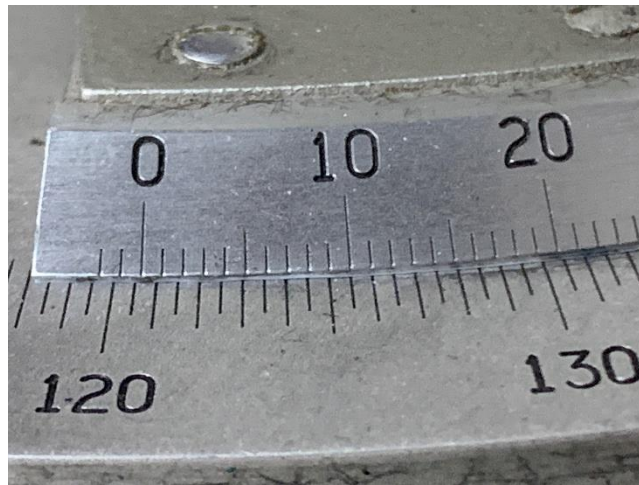


Photo 3 of 3 for helium blue-violet.

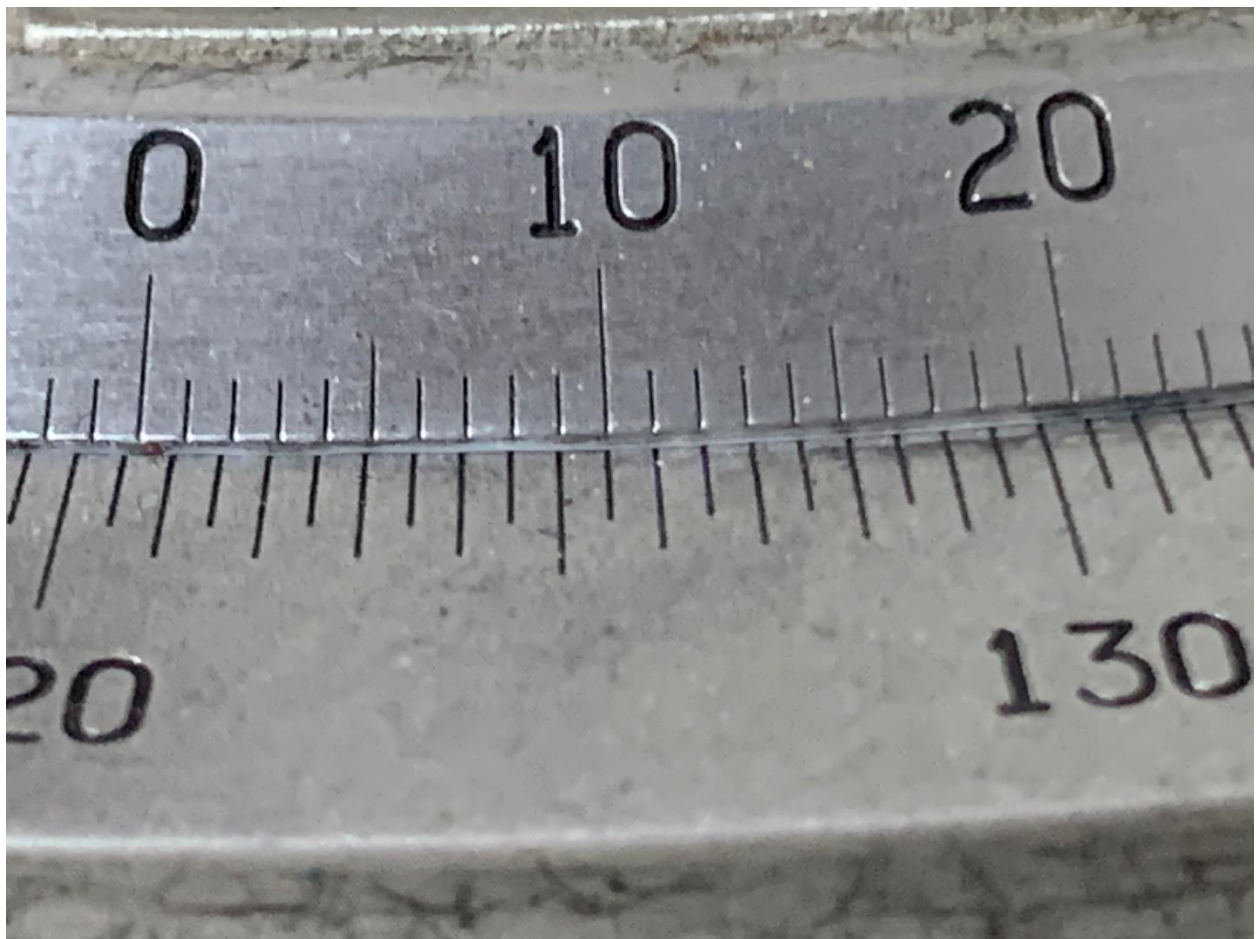


Photo 1 of 3 for helium bright blue.

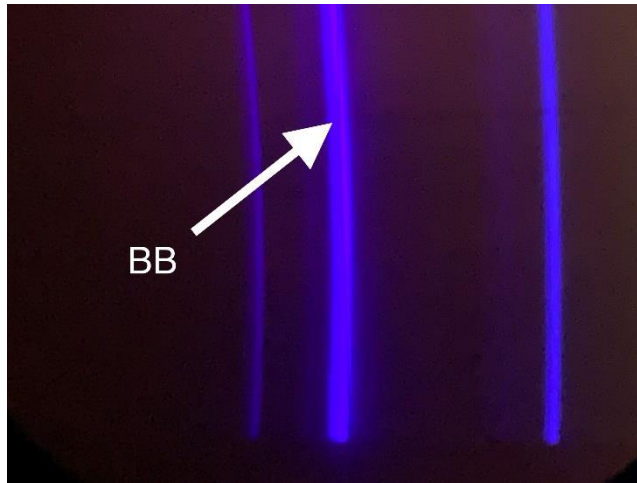


Photo 2 of 3 for helium bright blue.



Photo 3 of 3 for helium bright blue.



Photo 1 of 3 for helium blue.

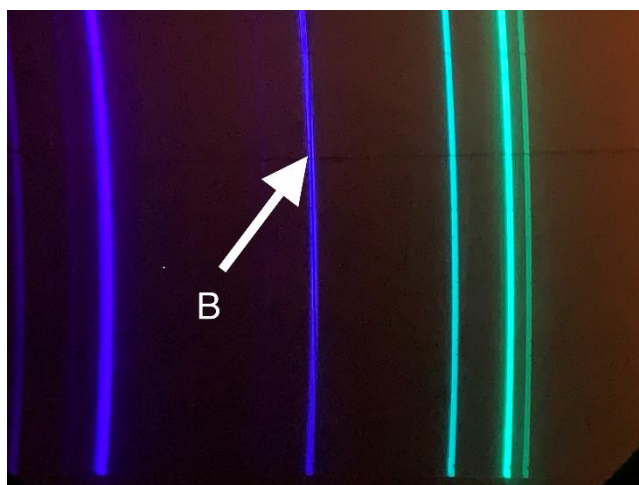


Photo 2 of 3 for helium blue.

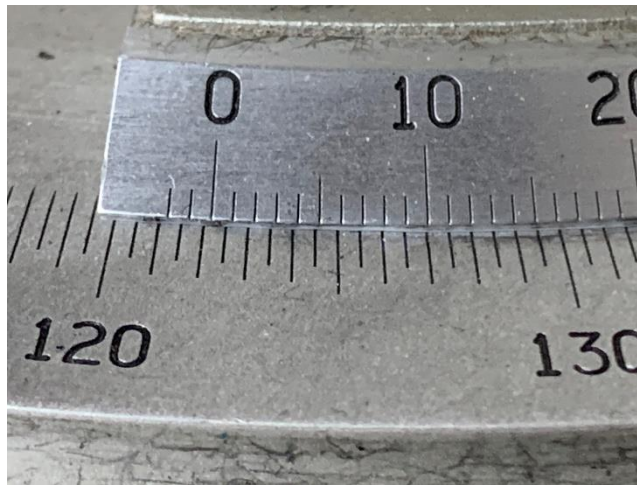


Photo 3 of 3 for helium blue.

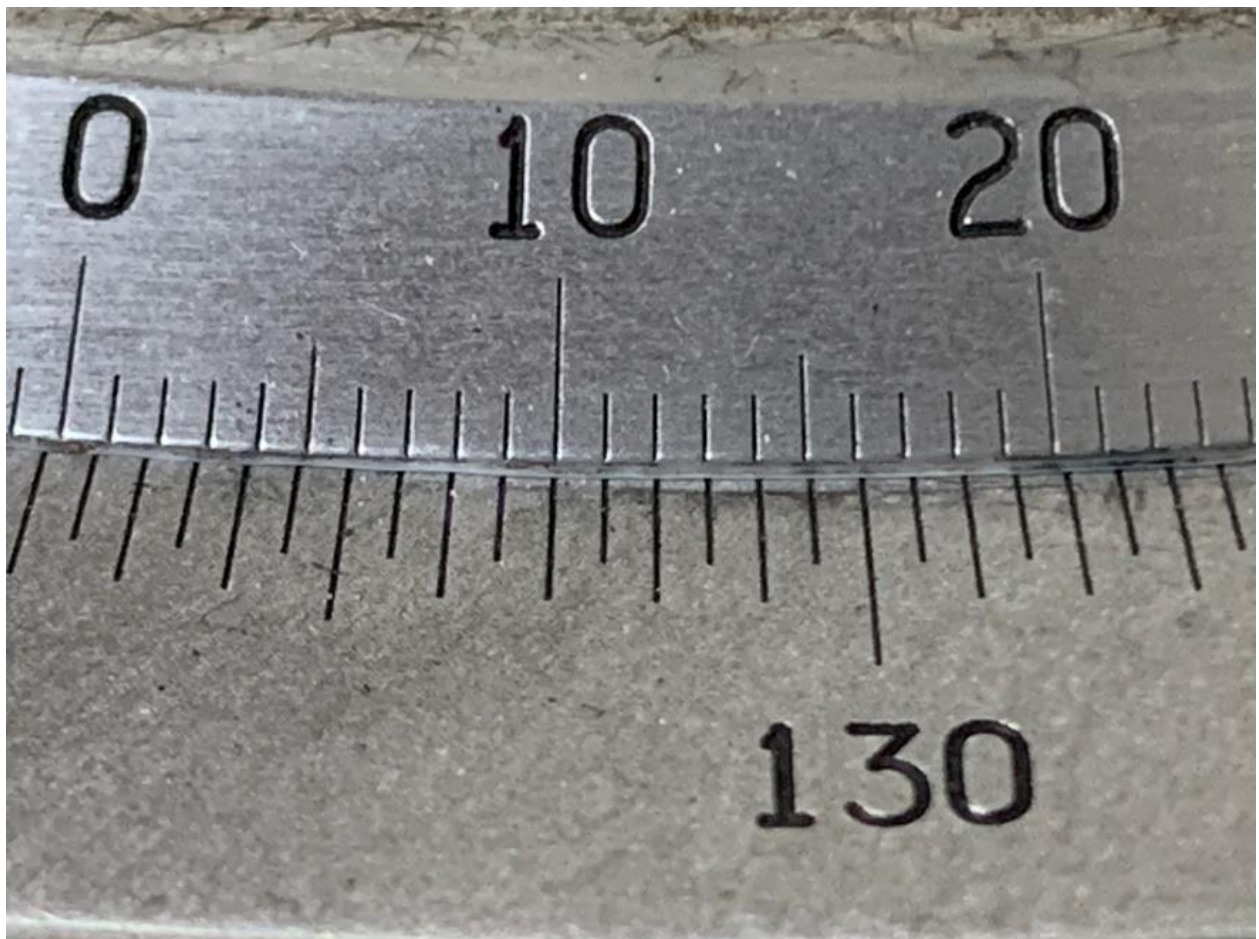


Photo 1 of 3 for helium green.

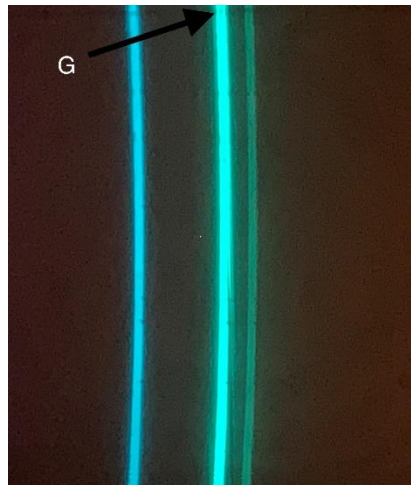


Photo 2 of 3 for helium green.

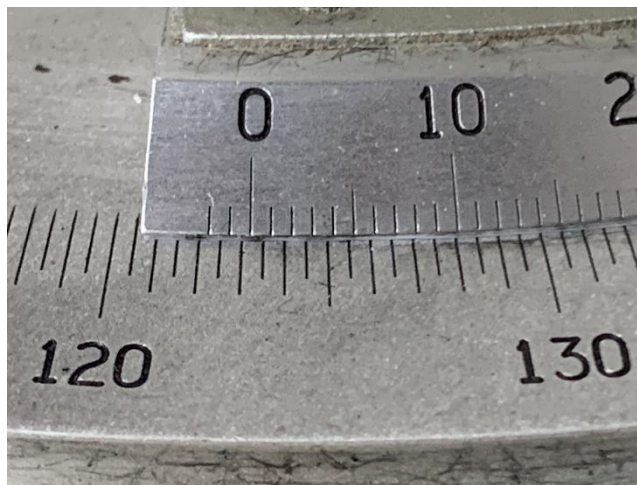


Photo 3 of 3 for helium green.



Photo 1 of 3 for helium yellow.

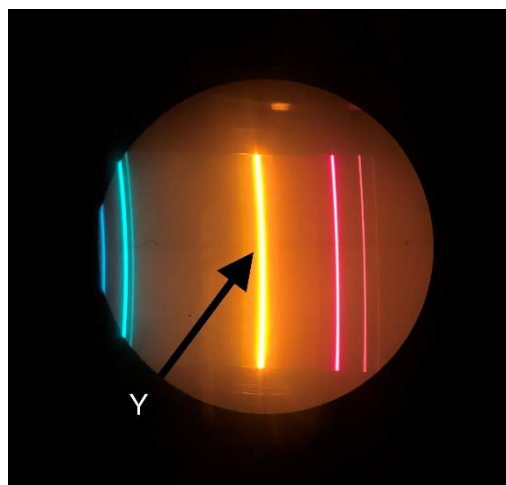


Photo 2 of 3 for helium yellow.

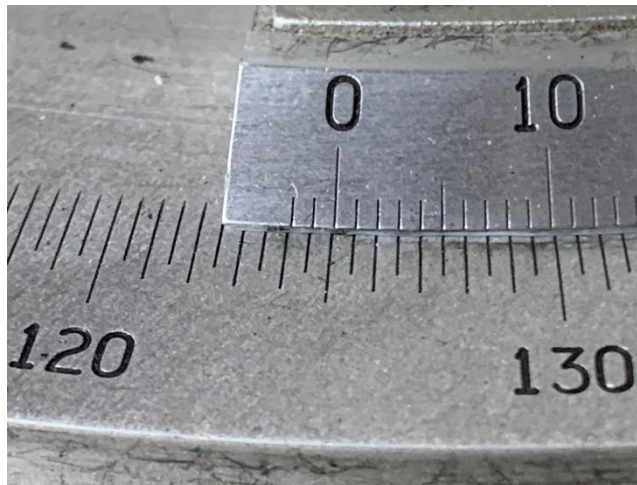


Photo 3 of 3 for helium yellow.



Photo 1 of 3 for helium red.

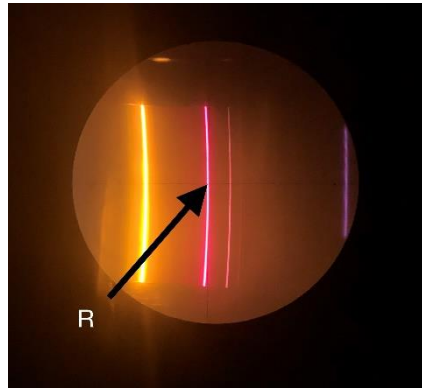


Photo 2 of 3 for helium red.

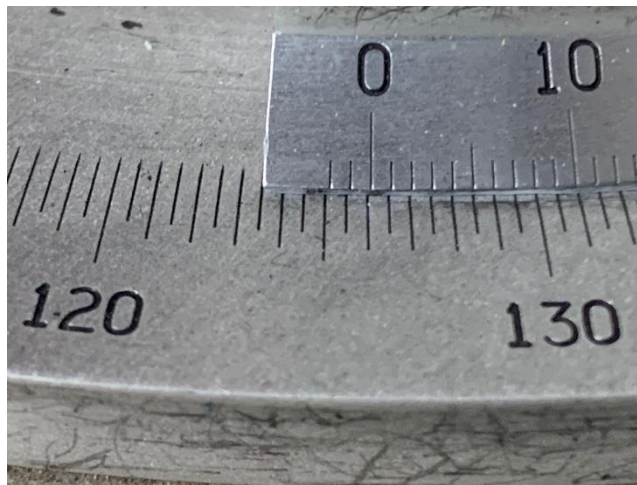


Photo 3 of 3 for helium red.

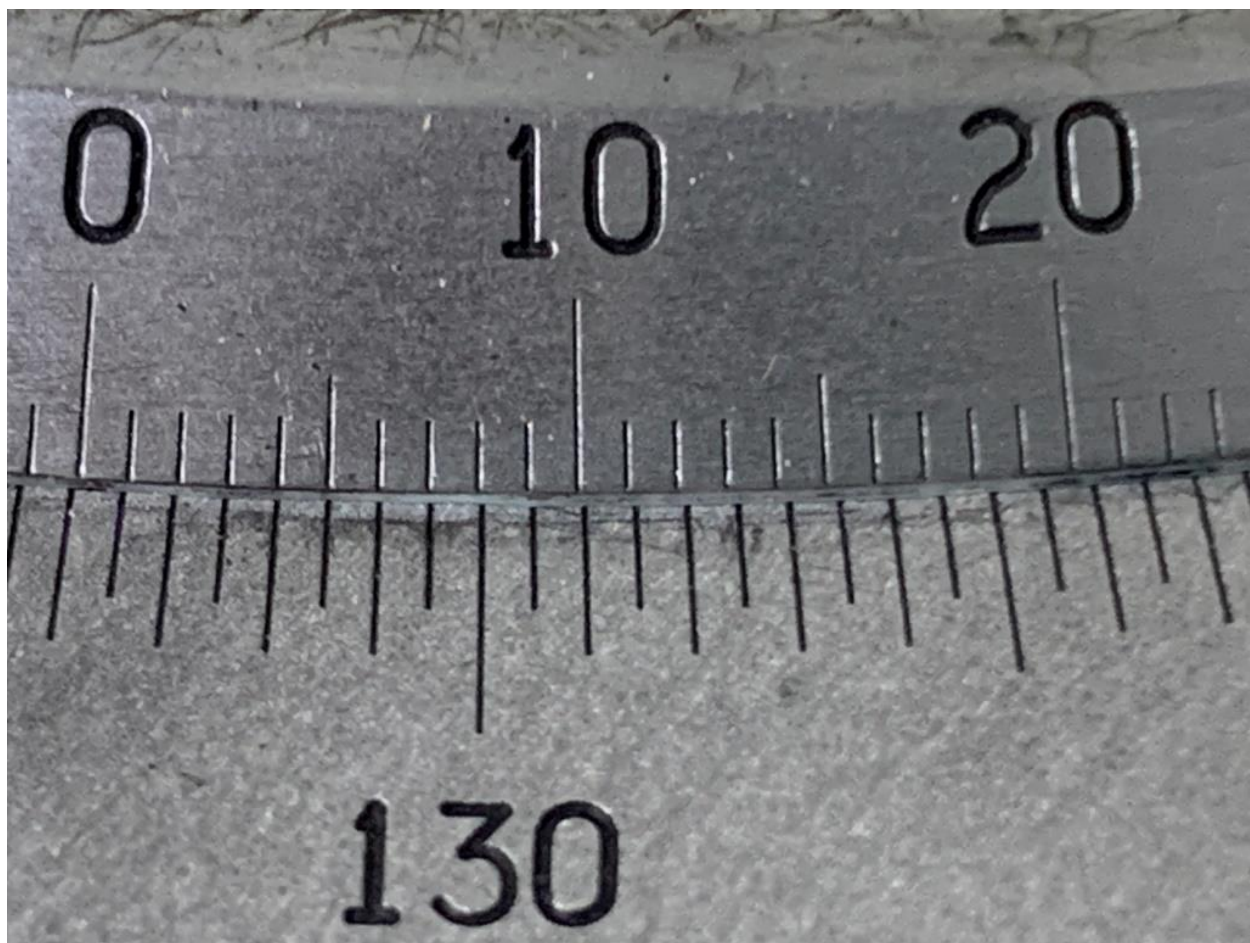


Photo 1 of 3 for helium faint red.

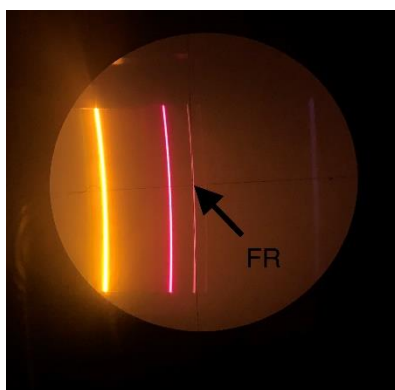


Photo 2 of 3 for helium faint red.



Photo 3 of 3 for helium faint red.



Photo 1 of 3 for hydrogen deep violet.

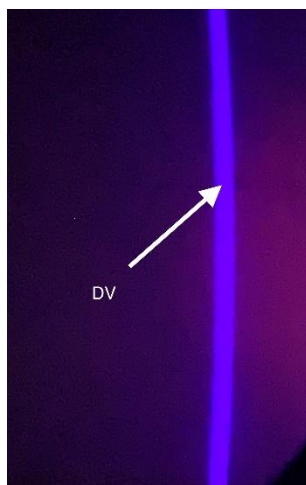


Photo 2 of 3 for hydrogen deep violet.

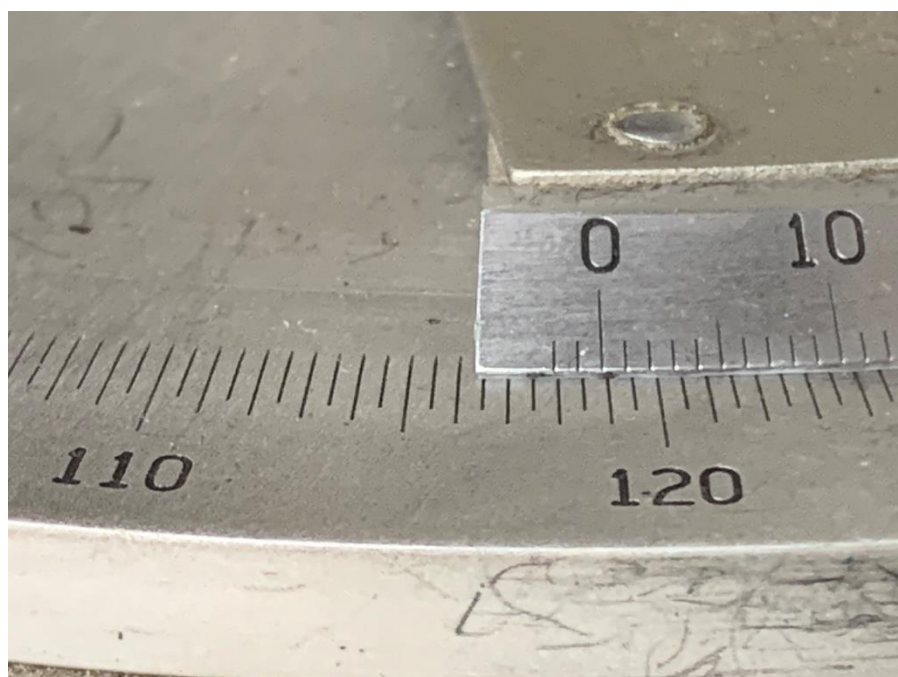


Photo 3 of 3 for hydrogen deep violet.

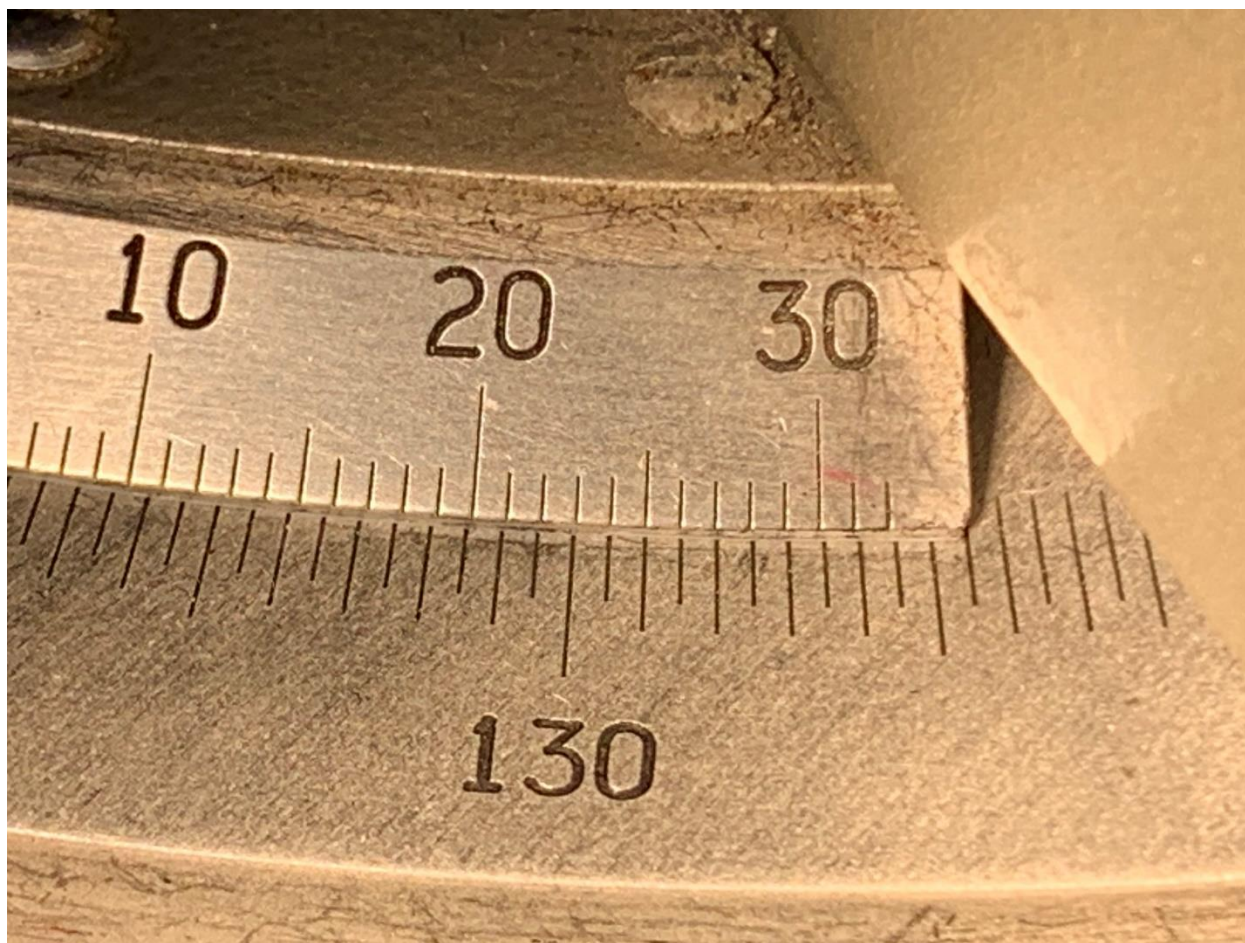


Photo 1 of 3 for hydrogen blue violet.

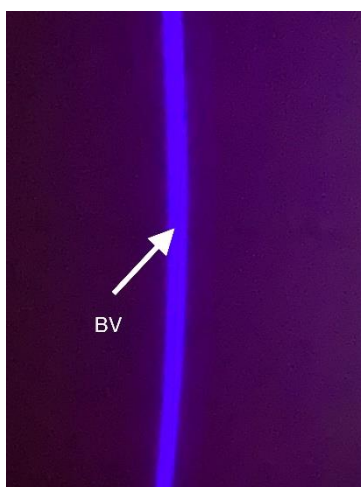


Photo 2 of 3 for hydrogen blue violet.



Photo 3 of 3 for hydrogen blue violet.



Photo 1 of 3 for hydrogen blue green.

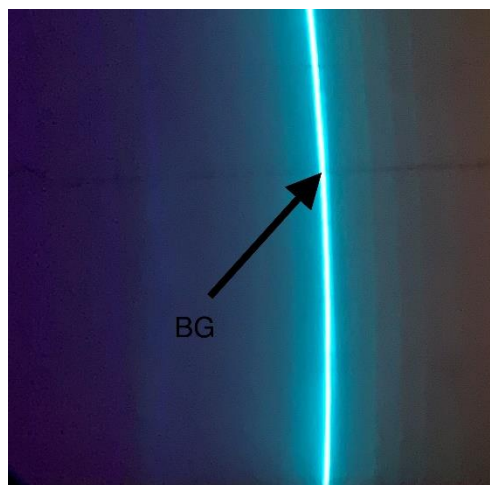


Photo 2 of 3 for hydrogen blue green.



Photo 3 of 3 for hydrogen blue green.



Photo 1 of 3 for hydrogen red.

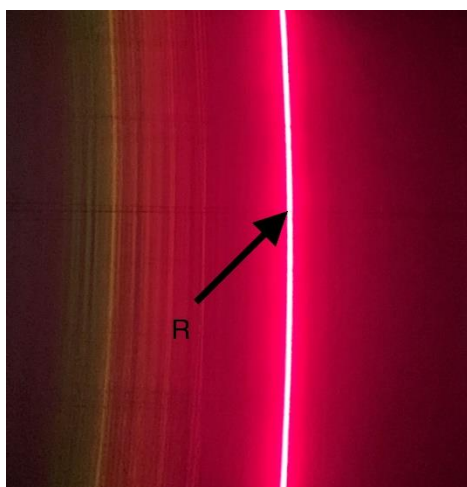


Photo 2 of 3 for hydrogen red.

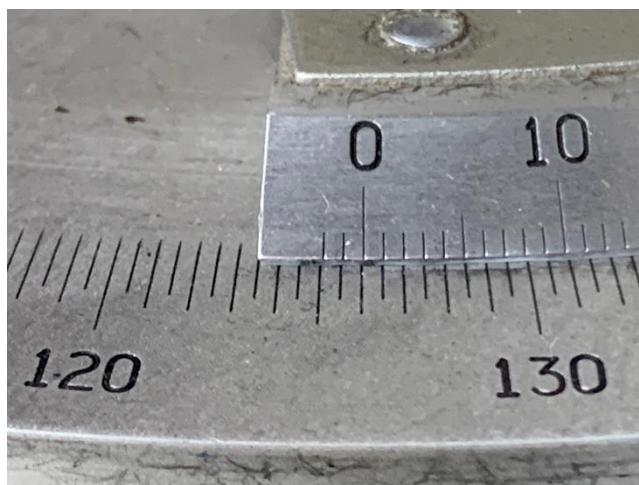


Photo 3 of 3 for hydrogen red.

