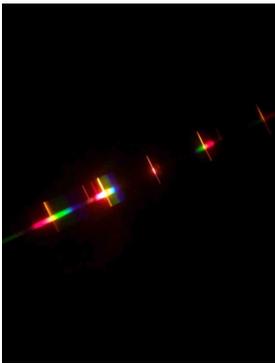
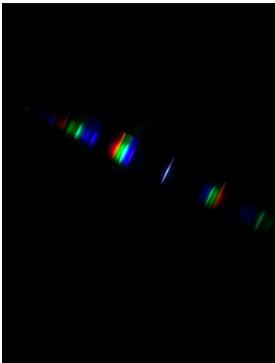
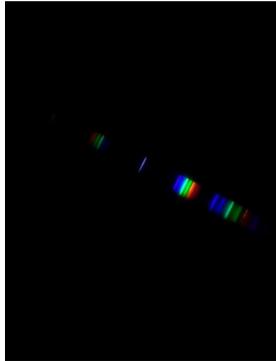
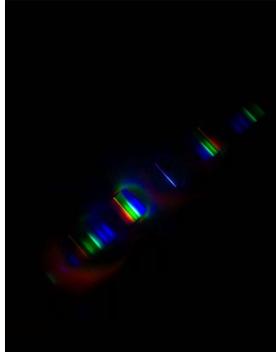
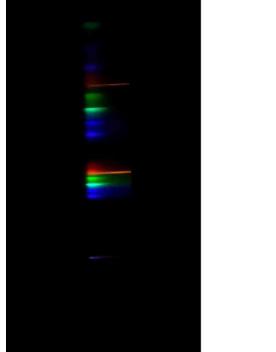
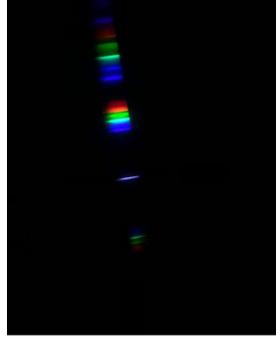


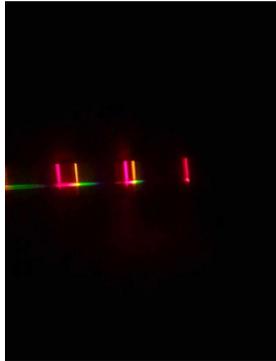
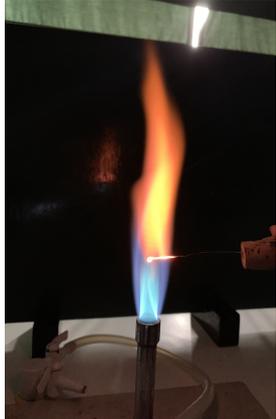
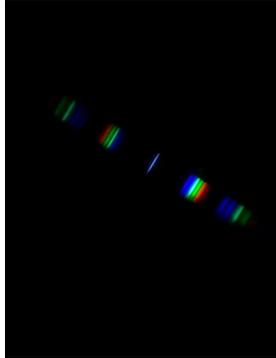
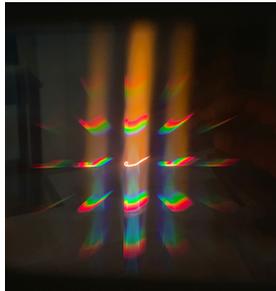
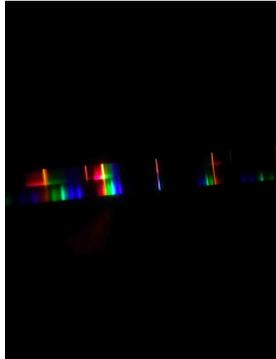
Lab Title - An experiment to verify the Emission Spectra of Metal Ions

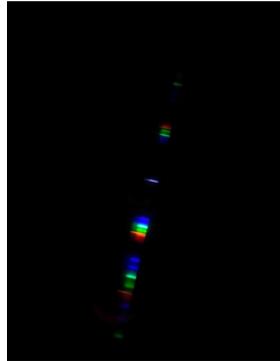
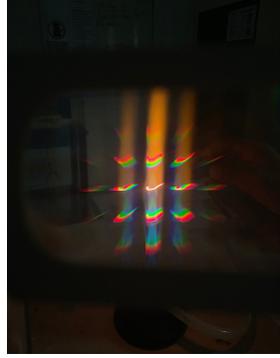
Purpose / Inquiry - To verify the emission spectra of metal ions, by burning different ones and looking at them with the refraction scopes and comparing it to what we see online. Also, to identify the unknown identity of different gases using a gas discharge tube, and looking online to see which one is which.

Data collection - Table 1: Flame Emission of Metal Ions

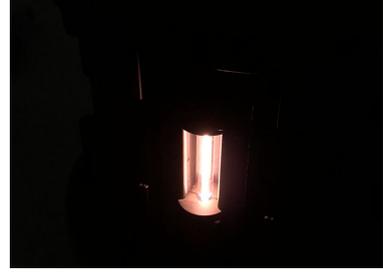
Nature of Metal Ion	Picture of flame	Emission spectra (our picture)	Qualitative Observations
Ba ²⁺			It becomes a very light green, near yellow, and quickly fades into a regular orange flame. In the image, it appears yellow, but it has a green tone when seen in person.
Ca ²⁺			It becomes a bright, nearly neon red as soon as the metal tip touches the flame and then immediately disappears.
Cu ²⁺			It is immediately neon green, but fades instantly and becomes the regular orange flame.

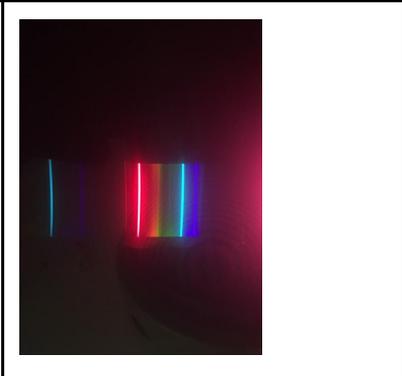
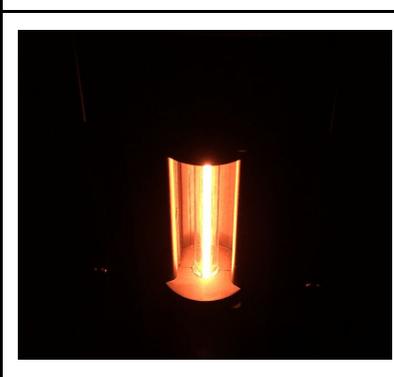
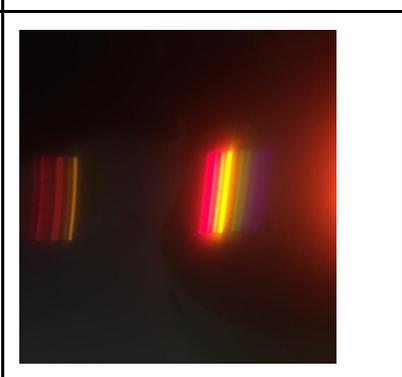
Fe ²⁺			<p>Immediately it is bright orange, but the color fades away very quickly into the regular flame once more.</p>
Fe ³⁺			<p>Colorless</p>
HCl			<p>It takes some time for the flame to change color. Once it does, it becomes a sharp orange, but lingers for a few seconds and then fades away.</p>
K ¹⁺			<p>Light pink, it fades away very quickly.</p>

Li ¹⁺			<p>Very strong fucsia, lingers for a long time before fading away.</p>
Mg ²⁺			<p>Colorless</p>
Na ¹⁺			<p>Very sharp orange, lingers for a moment and then fades into the regular flame.</p>
Pb ²⁺			<p>At once, it is a soft shade of pink, but as a little bit of time passes, the pink intensifies and becomes a near-red colour.</p>

Sr ²⁺			Sharp, neon red instantly, but then fades quickly.
Zn ²⁺			Takes time to change color, and it varies between green and then turns pink-red.
Ni ²⁺			Colorless

Data table 2: Analysis of Gas Discharge Tubes

CAROUSEL SAMPLE	EMISSION SPECTRA	Identity of the element
		Krypton, Kr.

		<p>Hydrogen, H.</p>
		<p>Argon, Ar. It is often used alongside mercury vapor in advertising signs.</p>
		<p>Oxygen, O.</p>
		<p>Neon, Ne. Intense light, frequently found in neon signs and neon lamps on the streets.</p>

Application - Come up with two ideas where the emission spectra are used as detective nature to identify something unknown:

1. In astronomy, the use of emission spectra helps to identify the ions or atoms that emit light from the Sun and other stars, with a Hubble Space telescope.
2. In science, the use of emission spectra helps to identify the identity of an unknown element. When an atom absorbs energy, its electrons are excited to higher energy levels. Then they

jump back down again, releasing a packet of light called a photon, and elements have a specific emission spectra (much like our own fingerprints) that help us determine what type of element it is.