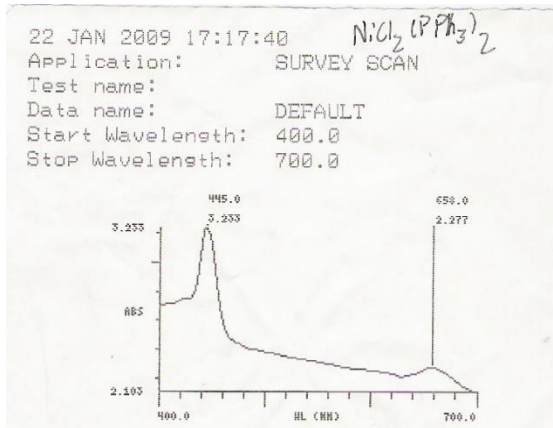


## UV-LED Mass Spectrometry Research

1. While photodissociation mass spectrometry is used in biology research to characterize ions and proteins, the LED used in tests are calibrated to frequencies which fragment only certain ions (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3966968/>). A more generic test, one which could check for certain molecules in a water sample, could use more than one LED.
2. UV-vis sensing seems to also check a range of wavelengths. The below survey scan searches from 400-700nm wavelengths.



3. Spectrophotometers are handheld used to identify compounds based on their wavelengths. They measure a molecule's absorption of light and maps the spectra across a range of wavelengths. These spectra are unique to a molecule which can be quickly identified. (<https://www.mt.com/>). This is more-or-less what we would like to accomplish, but with non-laboratory equipment.
4. Spectrophotometry is already used to determine water quality and identify pollutants (<https://www.hunterlab.com/blog/color-measurement-2/measuring-water-quality-with-spectrophotometry-the-best-approach-for-identifying-the-unknown/>, <https://www.sciencedirect.com/science/article/pii/S0043135417306735>, <https://www.selectscience.net/editorial-articles/exploring-the-benefits-of-uv-vis-for-ensuring-drinking-water-safety/?artID=40825>).
5. UV-vis can determine the concentration of a molecule in a sample, which can be used to assess quantitatively whether a water source is safe (Beer-Lambert law).
6. UV-vis databases exist which catalog information about molecules and can be used to identify them on-field (<http://www.bio-rad.com/en-us/product/uv-vis-spectral-databases?ID=NH262L4VY>).
7. Source on the development of a UV-LED spectrophotometer. [https://chem.libretexts.org/Textbook\\_Maps/Analytical\\_Chemistry/Book%3A\\_Analytical\\_Chemistry\\_2.0\\_\(Harvey\)/10\\_Spectroscopic\\_Methods/10.3%3A\\_UV%2F%2FVis\\_and\\_IR\\_Spectroscopy](https://chem.libretexts.org/Textbook_Maps/Analytical_Chemistry/Book%3A_Analytical_Chemistry_2.0_(Harvey)/10_Spectroscopic_Methods/10.3%3A_UV%2F%2FVis_and_IR_Spectroscopy)