

MAKING PORTABLE AND LESS EXPENSIVE FLOURESCENCE BASED SPECTROMETER FOR MONITORING THE QUALITY OF OLIVE OIL

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Motivation

1. Olive oil is good source if vitamins and the quality determines how healthy it is.
2. Most spectrometers are complex and cost in the thousands.
3. making a cheap miniature spectrometer to determine the quality of olive oil.

Abstract

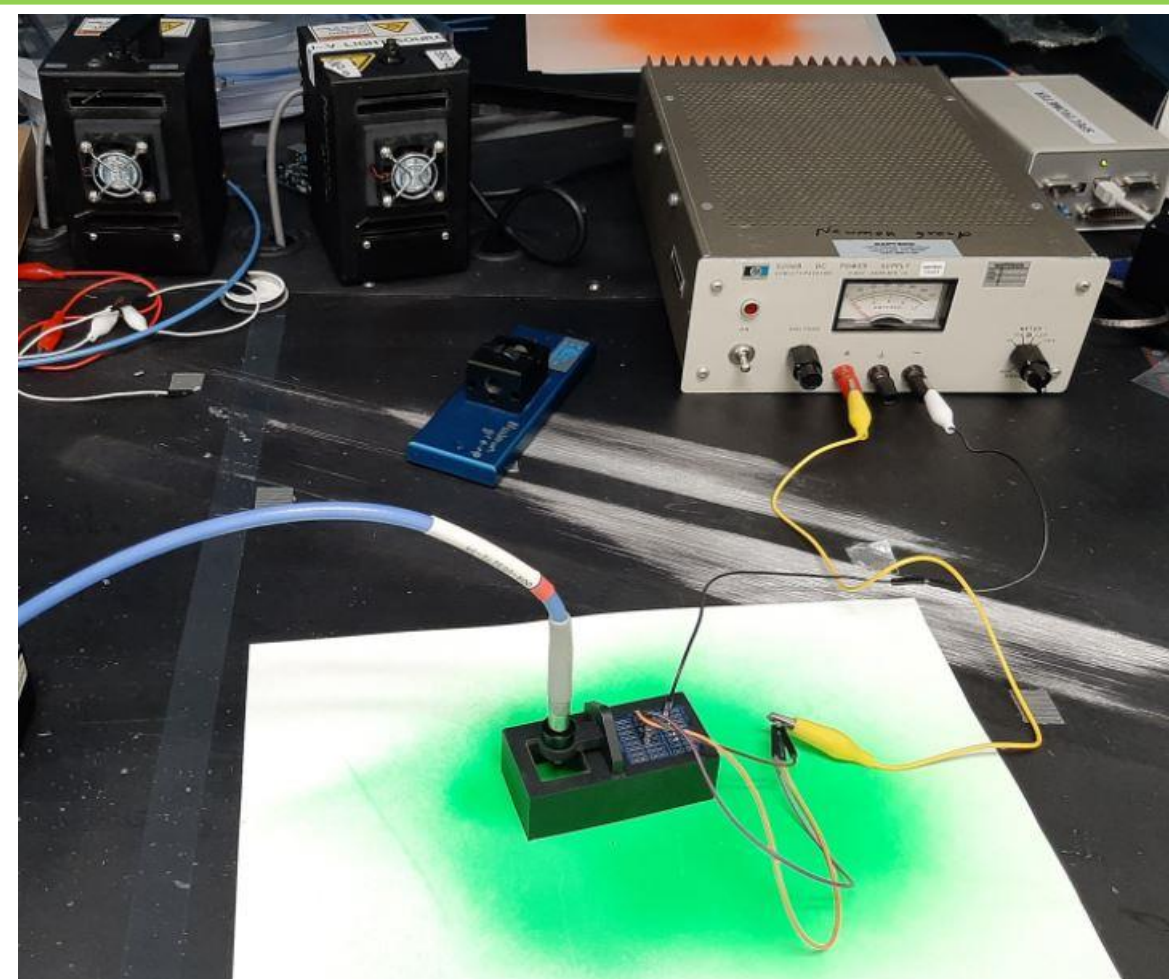
Olive Oil is a source of vitamins to aid in the proper growth and healthy growth of the human system, however determining the quality of olive oil with a cheap technique has always proven difficult. Visual inspection of Olive Oil using the human eyes has been the usual method of inspection. Sometimes people go to the extend of using the smell of the olive oil to determine its quality. However, this method for Olive Oil quality analysis are prone to human errors. Therefore, a quick and more reliable quality evaluation system is needed

Methodology

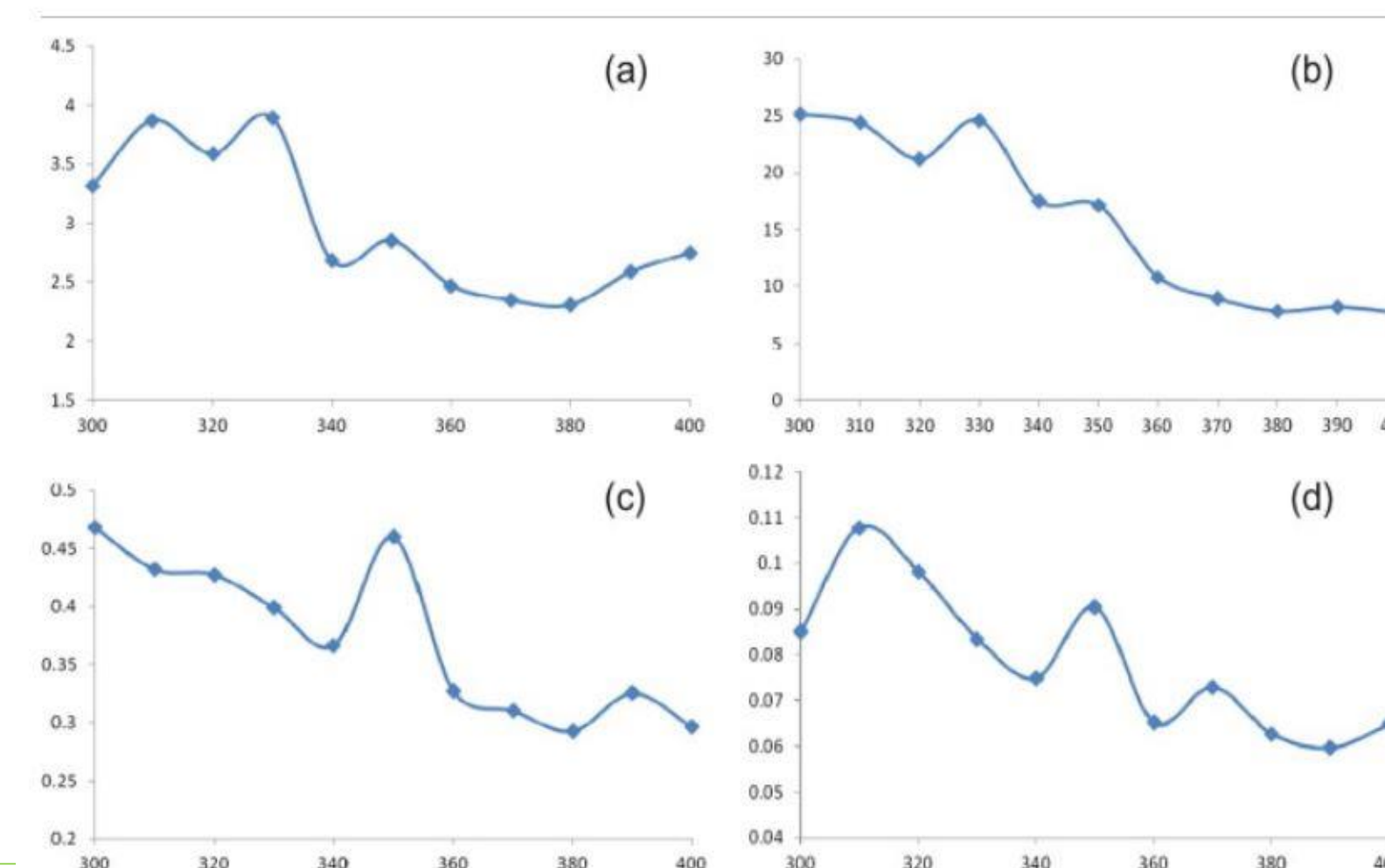
The light source is connected to a voltmeter(Preferably 70V). The spectrometer is then connected to a desktop interface and to the probe. When the circuit is closed, the light from the LEDs excite the pigment and

it fluoresces at specific wavelengths. The probe collects the fluorescence data and transmits it through fiber optics cables to the spectrometer. The Spectrometer then converts the data into a spectrum on the desktop interface. 6.From the data, analysis are made

Experimental Set-up



Results and Discussion



Root mean square error of cross-validation in axis y , excitation wavelength (axis x). (a) acidity, (b) peroxide value (PV), (c) K232 and (d) K270, respectively

Achievements

- A final design module was finalized.
- A Prototype of the Fluorescence spectroscopy was built.
- An experimental setup was established.

Challenges

- Due to COVID-19, effective testing was limited

Conclusions and Future Work

SciHUB fluorescence spectrometer can be economically competitive to other complex spectrometers. Oxidized compounds of virgin olive oil gave a specific fluorescence bands over 400–460 nm. Samples with the lowest level of oxidation did not show fluorescence around the 415–600 nm emission wavelengths

References

- Fluorescence spectroscopy for monitoring deterioration of extra virgin olive oil during heating .Analytical and Bioanalytical Chemistry, 382(6), 1438–1443..

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