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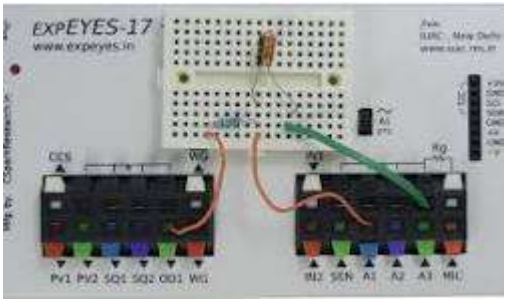
ANALYSIS BY USING EXPEYES KIT TO DETERMINE THE VIBRATION MODES OF THE LIQUID

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ABSTRACT
ExpEYES stands for "Experiments for Young Engineers and Scientists". It's a hardware and software platform designed to facilitate learning science through hands-on experimentation.It helps to determine the vibration mode of any liquid sample like bases we would preparing for ccl4 there is different types of vibration mode it is determined by connecting anode cathod to the liquid. Using digital circuits and softwere seelab3.0 completes the analysis.

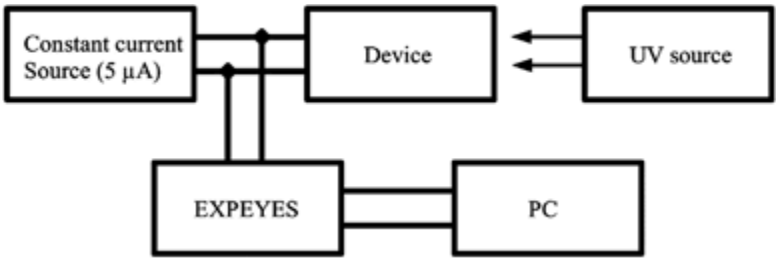
INTRUDUCTION
ExpEYES provides a hardware and software framework for developing science experiments, demonstrations and projects without getting in to the details of electronics or computer programming. The device acts as a collection of test equipment providing the functions of Voltmeter, Oscilloscope, Function Generator, Data Logger etc. It converts your PC into a science laboratory. The design of ExpEYES combines the real-time control/ measurement capabilities of micro-controllers with the ease and flexibility of Python programming language for data analysis and visualization.

In liquid CCl4, there are nine normal vibrational modes, but due to symmetry, not all are IR-active. The fundamental vibrations are ν1 (symmetric stretch), ν2 (symmetric bend), ν3 (asymmetric stretch), and ν4 (asymmetric bend). The molecule's high symmetry leads to degeneracy, meaning some vibrations have identical frequencies and are indistinguishable. While there are nine normal modes, only four fundamental vibrations are different.



METHODS
particular amount of of liquid is taken in a beakar connecting the both nodes to liquid sample and those nodes are connected as usb connecting to computer selecting the seelab.17 softwere analysis program corresponding result is obtaining under the different time and voltage.





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Normal Modes
CCl4, being a penta-atomic molecule, has 9 normal vibrational modes.
Symmetry and Degeneracy
Due to its tetrahedral structure, CCl4 has high symmetry, which leads to degeneracy. This means that some vibrations are indistinguishable and have the same frequency.
IR-Active Vibrations:
Not all vibrational modes are IR-active. In CCl4, only the asymmetric stretching and asymmetric bending modes are IR-active.
Fundamental Vibrations:
The four fundamental vibrations in CCl4 are:
ν1: Symmetric stretch
ν2: Symmetric bend
ν3: Asymmetric stretch
ν4: Asymmetric bend

Raman Activity
CCl4 is a good molecule for Raman spectroscopy studies. The symmetric stretch (ν1) mode in CCl4 exhibits fine structure due to isotopic variations, making it a useful tool for studying molecular structure and dynamics.

Liquid State
In the liquid state, intermolecular interactions and long-range correlations can influence the vibrational properties of CCl4. Studies have shown that the ν and ν + ν intra-molecular vibrations are strongly polarized transverse to the scattering wavevector in liquid CCl4.

RESULT AND CONCLUSION

CCl 4 has nine normal vibrational modes; in the T d point group these are labelled ν 1 (non-degenerate, A 1), ν 2 (doubly-degenerate, E), ν 3 (triply degenerate, T 2), and ν 4 (triply degenerate, T 2). ...B

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