STUDY OF ATOMIC STRUCTURE ON THE BASIS OF MODERN TECHNOLOGIES

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ANNOTATION

This article is about teaching atomic structure using various modern methods and modern devices and developing students' skills.

Keywords: Planck's constant, Frank-Hertz, photoelectric effect, photons, Balmer, Ridberg's constant, diffraction grating

INTRODUCTION

The Atom has been understood through atomic models since its discovery, and therefore teachers attempttirishga to understand the structure of the atom using these models to help their students understand its structure more easily.

Today, the field of Science and technology is developing rapidly. No matter what area we are in, we will witness the news. It will be permissible for us to recognize the work carried out by young scientists in our country on the path of science. The youth of Uzbekistan in the field of Science and technology also has its worthy place. In order to increase the scientific potential, training is currently being conducted on the basis of a number of new technologies, such as the use of modern teaching methods, such as teaching computer, multmedia, vedio and TV programmes, the use of the internet in distance learning.

In this regard, it is permissible to emphasize the importance of using physical equipment from developed European countries directly in the educational process. The process of working on these equipment greatly contributes to the formation of students ' imagination and skills about atomic structure.

As an example, we can perform laboratory work in a practical and virtual way, such as determining the continuity of Plank in combination with modern teaching of atomic structure, Frank-Gerts experience with Mercury, studying the optical spectrum of the hydrogen atom.

Determination of Plank continuous h

$$h \text{ or } \hbar = \frac{h}{2\pi}$$

It is one of the fundamental constants of physics and is used in the description of the properties of microphysical objects, for example, electrons and photons, quantum

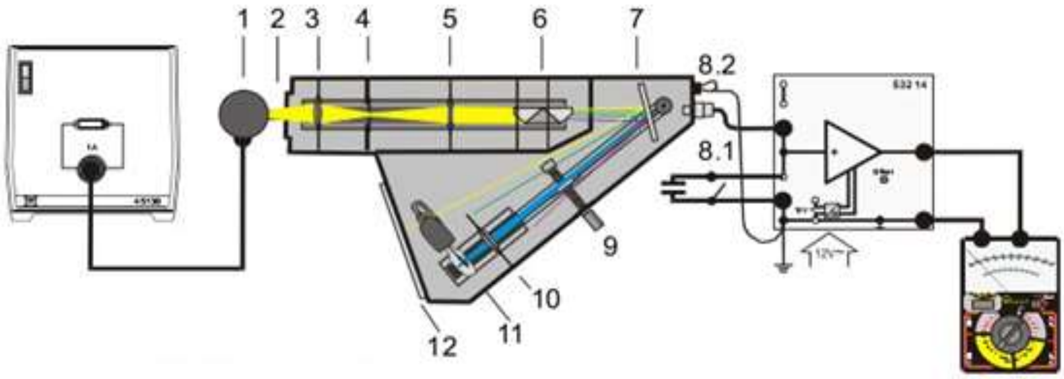
Therefore, Plank continuous kop is used as a fundamental constant in describing the quantum properties of nature in experiments. In this experiment, the Plank constant h is determined using a photoelectric effect. Electrons can be struck from the metal surface with the help of light rays (photoelectric effect). The number of" photoelectrons " will depend on the intensity of the light.

However, the energy of the struck electrons will depend only on the frequency of light. The results of these experiments were understood by Eyinshteyn in 1905. Here he hypothesized that light consists of a stream of particles called "photons", and assumed that each photoelectric energy is struck by an individual photon that is proportional to the frequency, that is, the energy of the photon:

$$E = h \cdot v$$

The "Eyinshteyn attitude" represents the law of conservation of energy for this process. Each pulse receives the h·v energy of the electron photon. The output work is obtained as a kinetic energy crop by the excess energy electron from W:

$$E_{kin} = \frac{mv^2}{2} = hv = W$$



Schematic view of the Exspemental Device

1. high pressure mercury lamp
2. slider
3. collector lens
4. rustle
5. descriptive lens
6. the right viewing prism
7. mirror

8.1. BNC/4 mm plug for screened cable (cathode)
8.2. 4mm plug (anode in the ring)
9. device for twisting
10. folding lens with slit diffraction
11. photo-structure
12. mirror and reducer slider

In the picture presented above, we can evoke ideas and concepts about the photoefect in students by observing the photoefect phenomenon with the help of the modern laboratory. Another example is the detection of the optical spectrum of the hydrogen atom on the basis of modern information technology can be viewed in a vertual way.
In this laboratory work, the observation of spectral lines of hydrogen atoms using a diffraction grid with a high separation ability. From the Balmer series Yes, measure Hα, Hβ and Hγ wave lengths. Identification of Ridberg continuum R_∞.
In the field of view of the atomic hydrogen spectrum Yes, Hα, Hβ and Hγ, It has lines. These lines will belong to the sphere of the full series, which is obsessed with the sphere of ultra fiolet. Balmer created the following empirical formula for the frequencies of this series in 1885 year:

$$v = R_\infty\left(\frac{1}{2^2} - \frac{1}{m^2}\right) \quad m;\ 3,4,5,\ \ldots\ \ldots$$

$$R_{\infty} = 3.2899 * 10^{15} S^{1}$$ Ridberg continuous.

In the experiment, with the help of a Balmer lamp filled with water vapor, the output spectrum is transferred to a state of wakefulness. Water molecules with the help of an electric discharge are separated into a group of awakened hydrogen atoms and hydroxyl. Wave lengths of Hα Hβ and Hγ are determined using a diffraction grid with high separation ability.

DETERMINATION OF THE COMPARATIVE CHARGE OF AN ELECTRON

Studying the deviation of electrons in the magnetic field along the Orbital of rotation.
Determination of the magnetic field B as a function of the potential U accelerating electrons in a constant r-wave orbit.
Determination of the comparative charge of an electron.
By experimental means, the mass of an electron is difficult to determine m_e. And the comparative charge of an electron is considered easier to determine in experiments.

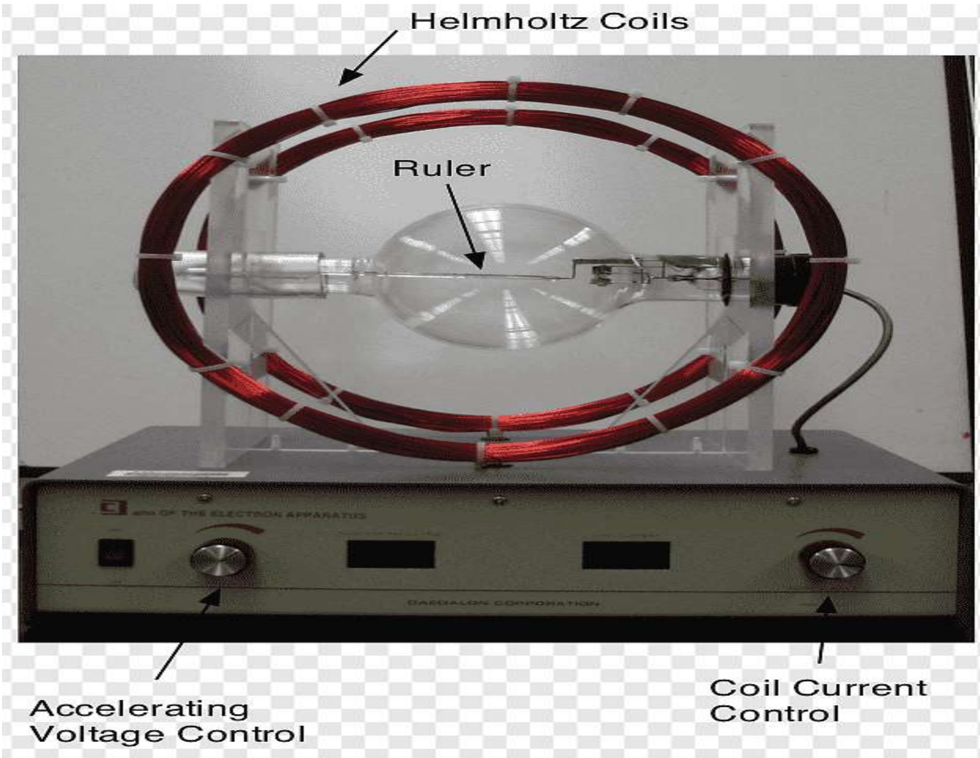
$$\varepsilon=\frac{e}{m_e}$$

If the elementary charge e is known (I) the mass of the electron from the expression can be determined by calculating me. The force of F Lorets on an electron moving at v speed perpendicular to the field at the same magnetic field B is affected.

$$F=Bev$$

And it is perpendicular to the velocity vector and the magnetic field. Power of aspiration to the center.

$F=\frac{m_e v^2}{2}$ it moves in a circular orbit under the influence of force



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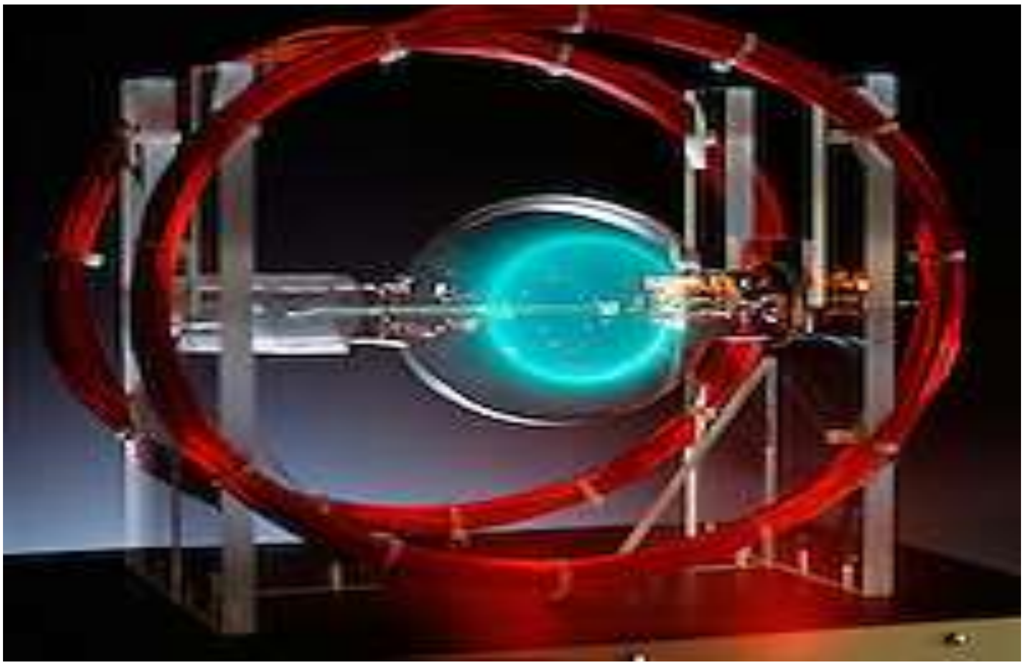

$$\frac{e}{m_e}=\frac{v}{rB}$$

In determining the comparative charge of an electron by means of the expression below, it is considered possible to determine by experiment with the latest and modern equipment and laboratory equipment.

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