



## **Guidelines For Independent Work On “Determination Of The Coefficient Of Internal Friction Of Liquids”**

**Mukhiddin Khalimovich Jalilov**

**Candidate Of Physical And Mathematical Sciences, Assistant Samarkand State Medical Institute, Uzbekistan**

**Shoira Narzullaevna Khudaykulova**

**Senior Lecturer Samarkand State Medical Institute, Uzbekistan**

**Jobir Kholmuradovich Khamroev**

**Assistant Samarkand State Medical Institute, Uzbekistan**

**Maruf Nasimovich Akhrorov**

**Assistant Samarkand State Medical Institute, Uzbekistan**

**Husan Muhiddinovich Jalilov**

**Assistant Samarkand State Medical Institute, Uzbekistan**

### **ABSTRACT**

This article is devoted to the passage of “determining the coefficient of internal friction of fluids” in a modular system. The value of the viscosity coefficient in medicine is explained by the fact that in diagnostics, the coefficient of internal friction (viscosity) can be determined using a VK-4 capillary viscometer. In addition, using the Stokes method, one can determine the processes occurring on the surface of liquids, and also mentions the determination of the internal friction coefficient by the Ostwald method.

### **KEYWORDS**

Fluid, viscosity, modulus, coefficient of friction, viscometer, bioreology, mechanical properties of tissues, Ostwald method, Poiseuille formula, Newtonian and non-Newtonian fluids

### **INTRODUCTION**

A total of 36 hours were given at the Samarkand State Medical Institute for independent work of students in medical and biological physics, and 80 minutes were

allocated for this topic. Due to the introduction of distance learning in all higher education institutions due to the coronavirus (COVID-19) pandemic in our country, students

are required to spend more time independently to master this topic.

### **THE MAIN FINDINGS AND RESULTS**

Through the Internet portal MT.sammi.uz on the page of medical and biological physics of the distance learning center SamDTI can use the following for students to independently perform the topic “Determination of the coefficient of internal friction (viscosity) of liquids by capillary viscometer and viscometer VK-4” [1.2]:

- Methodical instructions.
- Practical course materials.
- Texts of lectures.
- Slides (presentations).
- Abstracts.
- Video clips.
- Teaching tests.
- Picture tests.
- Control tests

Instructions for students to work independently:

- Feeling unable to be a mature professional without constant work with literature.
- Demonstrate maximum interest and activity in independent work.
- Independent acquisition of knowledge, knowledge and skills about real fluids, internal friction, Newtonian and non-Newtonian fluids.
- Obtains the necessary information through the website mt.sammi.uz, from training manuals.

The module system can use the following concepts:

1. Mechanical properties of solids and biological tissues.
2. Bioreology. Viscosity of biological fluids.
3. To study the motion of bodies in a viscous fluid.

4. Use of electronic textbooks and other databases.

Each student accesses the database of medical and biological physics from the Internet platform mt.sammi.uz through a personal login and password and uses the text of the lecture, methodological guidelines, slides, materials for practical training, abstracts, tests, case studies and other information [1].

The student writes essays on the topic on the basis of the following items, exchanges information with the students of the group, reads, masters and exchanges ideas [2.3]:

1. Newton’s formula.
2. The coefficient of internal friction of liquids and its unit.
3. The relationship between the viscosity coefficient SI and SGS systems.
4. Speed gradient.
5. Temperature dependence on viscosity.
6. Determination of viscosity of liquids using the Stokes method.
7. Determination of the coefficient of internal friction of fluids by the Ostwald method.
8. The concept of a viscometer.
9. Determination of the coefficient of internal friction using a medical viscometer.
10. Coefficient of viscosity of human blood.
11. Poiseuille formula.
12. Differences between methods of determining the coefficient of internal friction of a fluid.

Monitoring and evaluation of student independent work

Each student sends the information prepared on the independent work in electronic or picture format to the organized group by means of the telegram network. Submitted

data will be discussed among the group. Whenever possible, students will present their independent work in a video conference organized on the basis of the ZOOM program on the Internet. Active students are identified. The student will be assessed based on the above information.

The assessment of students' independent work is added to the assessment of practical training and is reflected in the assessment of the current control.4

### **REFERENCES**

1. Mt. sam.iz. Module 1. Lessons 2. Topic 3.
2. Umarov Sh.X., Bozorov E.X., Jabborova O.I., (2018)“Medical equipment and new medical technologies”. Tashkent:
3. Romizov A.N., Maksina A.G., Potapenko A.Y. (2011) “Medical and Biological Physics”