



Fig. 1. Spirometry graph of healthy person

At home we can check our lungs with Micro Diary. Handheld electronic data capture spirometer and records electronic patient reported outcome (ePRO). The Micro Diary spirometer is a compact and fully portable data recording spirometer specifically designed for patient spirometry monitoring at home.

Conclusions. Spirometry is very useful at excluding a restrictive defect. When the VC is within the normal range, the probability of a restrictive defect is < 3%, and unless restrictive lung disease is suspected a priori, measurement of lung volumes can be avoided. However, spirometry is not able to accurately predict lung restriction. For these patients, measurement of the TLC is needed to confirm a true restrictive defect. Each day we breathe about 20,000 times. All of this breathing couldn't happen without help from the respiratory system. It will help individuals understand their body more and how to take care of it too its fullest.

CONSTRUCTION OF 2D AND 3D GRAPHS IN THE MATHEMATICAL PACKAGE SCILAB

Sukova A.A.

Scientific supervisor: Ph. D. Korolev V. D.

National University of Pharmacy, Kharkiv, Ukraine

anna.sukova7@gmail.com

Introduction. Scilab – is a package of applied mathematical programs that provides an open environment for engineering (technical) and scientific calculations.

Aim. Justify the features of the mathematical package Scilab and experimentally test the effectiveness of the construction of two-dimensional and three-dimensional graphs in this program.

Materials and methods. Windows or Linux operating system; Mathematical program Scilab-5.5.2

Results and discussion. 2D and 3D graphs of different mathematical functions are built. 2D: Matplot — a description of the properties of Matplot objects; Sfgrayplot — a smoothed two-dimensional plot of the surface defined by a function using colors; champ1 — two-dimensional graph of a vector field with colored arrows; comet — two-dimensional graph with an animated comet; contour2d — surface level curves on a two-dimensional graph; contourf — surface level curves filled with color on a two-dimensional. Also we used such function as plot(x,y), plot(x1,y1,x2,y2), plot2d(x,y), plot2d2(x,y), polarplot(fi,ro), plotframe and subplot/ 3D graph:comet3d-3D comedy animated story; level contour-curves on a three-dimensional surface; fplot3d is a three-dimensional plot of the surface defined by a function; fplot3d1 is a three-dimensional graph of the level of gray or the color of a surface determined by a function; genfac3d – calculation of the faces of a three-dimensional surface; geom3d – projection from 3D to 2D after 3D graphics. Also we used such function as plot3d(x,y,z), plot3d1(x,y,z), plot3d1(x,y,z),

genfac(x,y,z), eval3dp(sc,p1,p2), linspace, mesh([X,Y],z), meshgrid([X,Y],z), surf([X,Y],z,[colour]). we compared the capabilities of various functions for plotting both 2D and 3D and made conclusions .

Conclusions. Scilab provides ample opportunities for creating, editing and plotting graphs of various functions. Each function has its own distinctive features. If we compare Scilab with other professional-level programs computing systems , such as Matcad, Matematica, and Matlab, we can conclude that it is not inferior to them in its capabilities and at the same time is free.

MEASUREMENT OF THE REDOX POTENTIAL AND HYDROGEN INDICATOR OF SOME AQUEOUS SOLUTIONS

Zubkov A.V.

Scientific supervisor: Ph. D. Korolev V.D.

National University of Pharmacy, Kharkiv, Ukraine

alieksandr.zubkov@gmail.com

Introduction. One of the important characteristics of the solutions and water including are indicators of ORP (redox potential) and pH (hydrogen index). It is believed that the use of water with indicators close to the indicators of the internal environment of a person has a beneficial effect on the body. This characteristic describes a measure of the ability of a substance to attach electrons, expressed in mV (millivolts). A system with more positive ORP has a lower ability to donate electrons to a system with even more positive ORP, while a system with more negative ORP has a greater ability.

Aim. Develop a scheme and collect pH meter. To measure the pH and ORP of some aqueous solutions and evaluate the change in these parameters over time. Compare the data with the indicators of the internal environment of the person and find out the most favorable for the body.

Materials and methods. Sensors pH, ORP and instrumentation amplifier on chips CA3140 and TL082. Scilab program and Calc table processor for the study of analytical dependence.

Results and discussion. The pH and the redox potential of magnesium, nettle, sorrel, different juices, beverages, alcohol, hydrogen and some others have been measured. The dependences of ORP on temperature and time are obtained. With the help of the Scilab program and Calc tabular processor the mathematical analysis of data are obtained too. A comparison of the obtained data with data from other sources. We have analyzed the results of functional dependence of the ORP on time. On the third day, oxidative processes predominate in solutions, as a result of which the ORP becomes more positive.

Conclusions. Close to the blood pH ranges (7.35-7.45) and more negative values of ORP (< -60 mV) are aqueous solutions of oats, magnesium, hydrogen, and some others. In accordance with the available scientific results, these solutions should be more suitable for the human body. It is recommended to take them on the first or second day after production.