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ОБУЧЕНИЕ ИНОСТРАННЫМ ЯЗЫКАМ В РАМКАХ ИНТЕГРАТИВНОГО ОБРАЗОВАТЕЛЬНОГО ПРОСТРАНСТВА «ШКОЛА-ВУЗ-ПРЕДПРИЯТИЕ»: ОПЫТ, ВОЗМОЖНОСТИ, ПЕРСПЕКТИВЫ

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О 60 **Обучение иностранным языкам в рамках интегративного образовательного пространства «школа-вуз-предприятие»: опыт, возможности, перспективы**, 12 ноября 2022 г.: материалы конференции; сборник тезисов докладов. – Казань: Изд-во ООО «Линк», 2022. – 182с.

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В сборнике представлены тезисы докладов и статьи преподавателей, студентов, магистрантов, аспирантов и молодых ученых, участников Всероссийской научно-практической конференции «Обучение иностранным языкам в рамках интегративного образовательного пространства «школа-вуз-предприятие»: опыт, возможности, перспективы».

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СОДЕРЖАНИЕ

15.4%. The Swedish krona is also in a strong position, its Big Mac index almost caught up with the US one, and the deviation was only 0.4%. Israel and Canada are also in the top 10 of the rankings among high PPP countries. Their indicators by currencies are approximately equal (7.9%) and (8.4%). Both countries are regularly at the top of the rankings, showing stable results [2].

It is also worth clarifying that in March 2022, McDonald's left the Russian Federation. Thus, the Big Mac Index was relevant for Russia until March 2022. However, in the Russian Federation, a network of restaurants "Tasty - and the point" was opened with a similar range of dishes. Of the Big Mac burgers presented there, the Grand Burger is similar (in terms of ingredients and cost). Given the inaccuracy of the very idea of the Big Mac Index, the use of the Grand burger to compile the index would be appropriate. Thus, the Big Mac index for the Russian Federation will remain relevant.

The Big Mac Index is a conditional indicator, intended more for illustration than for real scientific or practical calculations.

Due to the inaccuracies and imperfections of the Index, it is inaccurate and irrational to directly compare national currencies for serious calculations and in-depth analytics on the Big Mac Index.

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COMPARATIVE CHARACTERISTICS OF BIOGENIC AND CHEMICALLY SYNTHESIZED SILVER NANOPARTICLES

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The purpose of the study was to synthesize silver nanoparticles by two different methods – chemical and biological, and then conduct a comparative characterization of their size, shape and other parameters using electron microscopy.

Methodology.

The chemical synthesis of silver nanoparticles was carried out by the Lee-Meisel method. In a heat-resistant flask, 18 mg of silver nitrate was diluted in 100 ml of distilled water and set to heat at 760 r.p.m. at 250-300 ° C, covered with foil and brought to a boil with the formation of condensate. At the same time, a 1% sodium citrate solution was prepared – 20 mg was mixed with 2 ml of distilled water at a pH value of 8.3, then heated. When the silver nitrate boiled, citrate was added drop by drop and boiled for another 3 minutes. Then 1% sodium hydroxide was added drop by drop, until the pH value was 6.1 (the color changed to brown-gray). At the end of the addition of reagents, without turning off the mixing, the heating was turned off and the solution was cooled for 20-30 minutes [1], [2].

After that, biogenic synthesis of silver nanoparticles was carried out using sphagnum moss extract. Plants of Sphagnum fallax (H. Klinggr.) H. Klinggr. were collected in a natural source – an oligotrophic swamp. In the laboratory, the plants were washed and dried. Under sterile conditions, 1.35 g of dried plants were placed in a conical flask with 55 ml of boiling distilled water and boiled for 5 minutes. The resulting extract was settled and centrifuged for 5 minutes (2000 r.p.m.), after which the precipitate was removed. Water extract S. fallax was mixed sterile with an aqueous solution of AgNO3 (concentration of 1 mmol/L), in a ratio of 1:2 by volume, and dried for 7 days at 20 °C in the dark. The change in the color of the solution from transparent yellow to yellow-brown indicated the successful synthesis of silver nanoparticles. Both reaction solutions were centrifuged 3 times for 30 minutes (13,000 revolutions per minute), after that the nozzle was removed and the nanoparticles were washed from the reaction mixture with distilled water and concentrated. Preparations for microscopy were prepared from a washed suspension, without drying the samples.

The obtained samples of silver nanoparticles were analyzed using a transmission electron microscope JEOL JEM-2100 and a scanning electron microscope Zeiss MERLIN. A series of images were taken at different magnifications, the size and shape of nanoparticles were determined, and the tendency to conglomerate formation was noted.

Results.

Figure 1 shows microscopic images of synthesized silver nanoparticles. It was found out that biogenic nanoparticles could be divided into two groups by size – small (about 10 nm in size) and large (from 25 to 80 nm). The chemically synthesized nanoparticles were relatively smaller and were present in the range from 7 to 55 nm. The shape of silver nanoparticles was most often spherical or almost spherical, sometimes oval or irregular, and biogenic nanoparticles were mostly more rounded, compared with chemical ones.

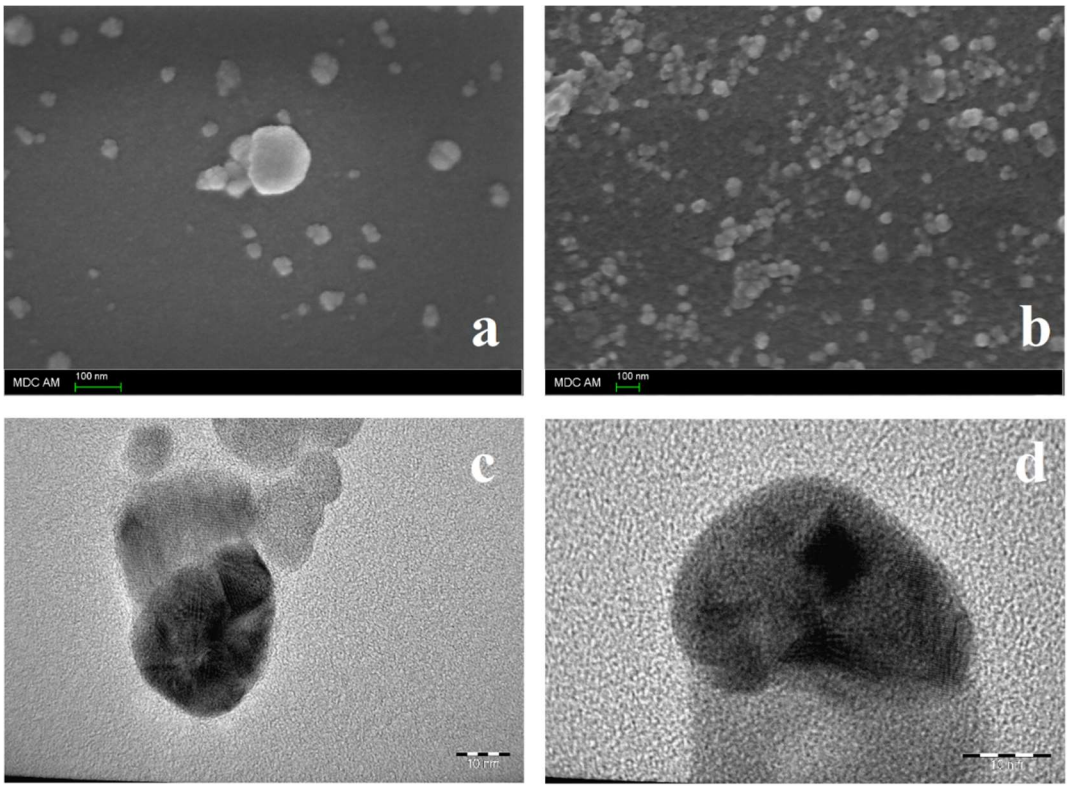

Figure 1. Images of chemically synthesized (a, c) and biogenic (b, d) silver nanoparticles. The images were taken using a scanning electron microscope (a, b) and a transmission electron microscope (c, d).

An important characteristic of nanoparticles is their stability, the ability not to form conglomerates. The stability of silver nanoparticles are primarily dependent of the solvent suspension, the ionic strength, the pH, and the type of capping agent [3]. During the analysis of microscopic images, it was found that biogenic silver nanoparticles formed conglomerates to a lesser extent, in comparison with chemically synthesized ones.

Conclusion.

As a result of biogenic synthesis, larger and more stable silver nanoparticles of predominantly spherical shape were obtained, in comparison with nanoparticles obtained by chemical method. These data can be useful in further research, when choosing a synthesis method to achieve a predictable result.

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SIMULATION MODELLING IN THE TESTING OF UNMANNED AERIAL VEHICLE SYSTEMS

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The article reveals the advantages of simulation testing of unmanned aerial vehicle (UAV) systems as an important component in the development of modern UAVs.

Unmanned aerial vehicle systems are being developed based on the latest advances in the science and technology sector. The continuously growing demand for unmanned aerial vehicles requires qualitative and quantitative development of production facilities from UAV manufacturing companies. With limited funding, manufacturers are forced to resort to alternative methods of aerial testing. Accompanying mathematical modelling of tests allows testers to get rid of the risks associated with loss of the model being tested, delays and large amounts of rework. Therefore, extensive use of full-scale, semi-numerical and mathematical modelling has become a necessary and non-alternative option in all phases of modern UAV development.

Objective.

At all stages of UAV design, a semi-numerical simulation with partial replacement of the main systems of the UAV under test is required in order to study the impact of all possible factors on the UAV. Information and hardware centralisation of the maximum amount of UAV data on the basis of a single software computing unit is proposed. Software development requires the selection of a structure by which it will be possible to test the software systems independently of each other.

Methodology.

On this topic, the applicants derived a methodology for accompanying flight tests, which consists of a set of methods used and experiments performed during the UAV test. Based on the results of the outputs of all subsystems and the perturbations in force

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