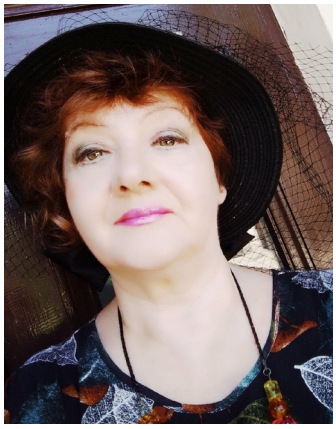
DOI: https://doi.org/10.59295/DIA.2024.2.15
CZU: 069.51:666.241(478)(091)
Orcid ID: 0009-0004-2399-1940

"GOLDEN RUBY" IN CHIȘINĂU, IN THE 20s OF THE 19th CENTURY



Valentina GRABOVSCAIA

Museographer, A.S. Pushkin House-Museum in Chișinău

"Golden Ruby" in Chișinău, in the 20s of the 19th century

Abstract. The purpose of this work is the history of the creation of the unique "golden ruby", ruby glass colored with gold nanoparticles in various shades of pink, red, crimson and purple, the recipe of which was kept in the strictest confidence for centuries. The oldest piece of ruby glass is considered to be the Lycurgus Cup, located in the British Museum, presumably created in the 4th century AD, associated with the Alexandrian culture.

It is surprising that in the early 1820s of the 19th century in Chișinău it was possible to purchase objects made from this precious glass. It is known that A.S. Pushkin in 1822, bought a ruby glass travel set at the Ilyinsky Bazaar, consisting of a tray, a decanter and four glasses, and treasured it as a memory of Chișinău. In 1828, Alexander Sergeevich presented this set to his older sister Olga on her wedding day, filling the decanter with his favorite Moldavian Madeira wine, diluted with water, as the Greeks did. The set was miraculously partially preserved and is now located in St. Petersburg, in the poet's last Apartment-Museum on Moika Embankment, 12.

In memory of the poet in the exhibition of the A.S. House Museum A.S. Pushkin in Chișinău presented a set of ruby glass, but for spices, consisting of four items: a salt shaker, a pepper shaker, a vinegar shaker, dating back to the beginning of the 19th century, which is of historical and literary value.

Keywords: ruby glass, history of the creation of "golden glass", exhibits from the collections of the A.S. House Museum Pushkin.

„Rubinul de aur" la Chișinău, în anii 20 ai secolului al XIX-lea

Rezumat. Scopul acestei lucrări este istoria creării unicului „rubin de aur", sticla rubin colorată cu nanoparticule de aur în diferite nuanțe de roz, roșu, purpuriu și violet, a cărei rețetă a fost păstrată cu cea mai strictă încredere timp de secole. Cea mai veche bucată de sticlă rubin este considerată a fi Cupa Lycurgus, aflată în Muzeul Britanic, creată probabil în secolul al IV-lea d.Hr., asociată cu cultura Alexandriană.

Este surprinzător faptul că la începutul anilor 1820, ai secolului al XIX-lea, la Chișinău a fost posibilă achiziționarea de obiecte realizate din această sticlă prețioasă. Se știe că A.S. Puşkin, în 1822, a cumpărat la Bazarul Ilyinsky un set de călătorie din sticlă rubin, format dintr-o tavă, un decantor și patru pahare, și l-a păstrat ca o amintire a Chișinăului. În 1828, Alexandru Sergheevici i-a oferit acest set surorii sale mai mari, Olga, în ziua nunții ei, umplând decantorul cu vinul său preferat de Madeira moldovenească, diluat cu apă, așa cum făceau grecii. Setul a fost conservat parțial în mod miraculos și se află acum în Sankt Petersburg, în ultimul apartament-muzeu al poetului de pe dig Moika, 12.

În memoria poetului, în expoziția A.S. Casa Muzeul A.S. Puşkin la Chișinău a prezentat un set de pahar rubin, dar pentru mirodenii, format din patru articole: o sticlă de sare, una de piper, una de oțet, datând de la începutul secolului al XIX-lea, care are o valoare istorică și literară.

Cuvinte-cheie: sticlă rubin, istoria creării „sticlei de aur", exponate din colecțiile A.S. Casa Muzeu Puşkin.

According to ancient legend, the discoverers of glass were Phoenician or Greek traders. Having made a stop on an island during one of their many voyages, they lit a fire on the shore. The sand melted from the high heat and turned into a glassy mass.

The invention of glass dates back to very ancient times. The appearance of glass is associated with the development of pottery. It is unknown which people invented glass and when. During firing, a mixture of soda and sand could get into the clay product, as a result of which a glassy film – glaze – formed on the surface of the product.

An image of glassblowers dating back to around 1600 BC was found in Thebes (Egypt). In Egypt there was a glassmaking center where urns, vases, statues, columns and jugs were made – this is indicated by the objects found during excavations of ancient Egyptian cities.

The color of the glass depended on the additives introduced. The amethyst color of the glass was given by the addition of manganese compounds. The black color was obtained by adding copper, manganese or a large amount of iron compounds. Much of the blue glass is colored with copper, although a sample of blue glass from Tutankhamun's tomb contained cobalt. Green Egyptian glass is colored with copper, yellow – with lead and antimony. Red glass samples contain copper oxides. Milk glass containing tin and clear glass items were discovered in Tutankhamun's tomb. Ancient glass products were luxury items that were not accessible to everyone; products made of colorless glass were especially highly valued. From Egypt and Phenicia, glassmaking moved to other countries, where crystal glassware even began to replace goldware, which had been used until that time.

In antiquity, glass did not find significant use; even mirrors were then made primarily of metal. In the Middle Ages, windows in churches began to be decorated with colored glass mosaics.

In the late Middle Ages and early modern times, glassblowing became widespread, and Venice was especially notable for this. The Venetians invented mosaic glass and mirrors; they jealously guarded the secrets of glass production; disclosing professional secrets was punishable by death. In the second half of the 15th century, the famous colorless transparent glass was invented in Venice – called *Venetian cristallo*.

"Golden ruby" is glass colored with gold nanoparticles in various shades of pink, red, crimson and purple. The composition of this glass included gold, silver and copper. They give the glass a unique red tint. Currently, ruby glasses are produced without the addition of expensive gold, instead of which copper or selenium is introduced into the glass.

Samples of glass containing nanoparticles of noble metals have been known since antiquity, the most famous of which is the Lycurgus Cup. The cup is currently on display in the British Museum. This is a bell-shaped vessel on a foot (it has not survived), apparently created in the 4th century AD and associated with the Alexandrian culture of that time. The cup depicts in high relief the scene of the death of King Lycurgus, who refused to honor Dionysus [1, p. 227].

The preservation of the ancient recipe is evidenced by the mention of golden ruby in the first scientific work on glassmaking (published in 1612 in Florence) by the Tuscan monk Antonio Neri, in which the compositions of colored glasses were given. The Venetian recipe is known from the records of John Darduino [2, p. 49].

Perhaps this recipe dates back to the production of ruby glass in France, organized by Italian Bernardo Perrotto (1640–1709). He was born in the Ligurian town of Altara, but became famous in France, where he emigrated in 1666 (in France he is known as Bernard Perrault). In 1668, he received a privilege from Louis XIV to produce ruby glass. It is believed that Perrault received the ruby recipe in 1668 from the alchemist Galot de Chasteille (Jean Gallaup de Chastueil), using his connections with the Marquise du Plessis and Count Bachimont. Perrault's workshop existed until the 1740s, but nothing is known about the works of this alchemist.

In the 17th century, a new method of ruby glass was developed – "Cassian purple", named after its creator, the doctor Andreas Cassius



Lycurgus Cup. 4th century AD (Au – 0.004).



Bernard Perrault Cup (Au – 0.021).

(although in fact there were two of them – father and son). Andreas Cassius the Elder (born in Schleswig in 1605 and died in Hamburg in 1673) and Andreas Cassius the Younger (1645–1700), father and son, were both doctors and chemists. Andreas Cassius the elder studied medicine in Leiden, where he received his diploma in 1632, and was subsequently physician to the Duke of Holstein and the Prince-Bishop of Lübeck.

His son of the same name, known as "of Hamburg", published in 1685 the process developed by his father (twelve years after the latter's death and without citing him), in a work in Latin, the very long title of which is often abbreviated as "De Auro" ("Gold"). There is information that "Cassian purple" was known even before Cassius, and its inventor is the German chemist and pharmacist Johann Rudolf Glauber.

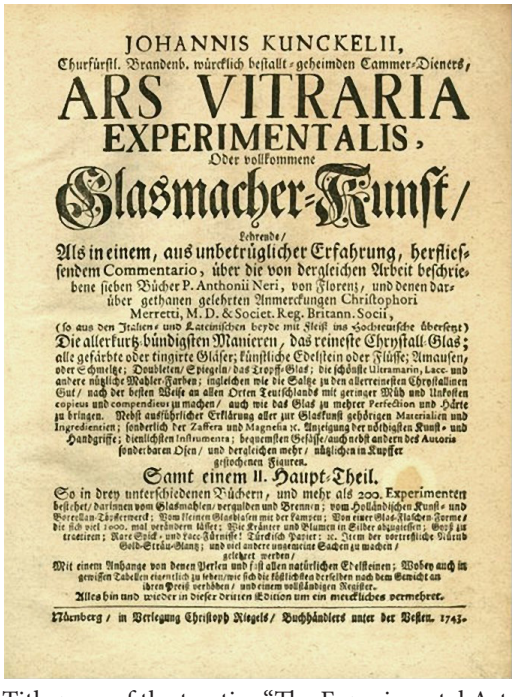
Johann Rudolph Glauber (March 10, 1604, Karlstadt – March 16, 1670, Amsterdam) – German alchemist, chemist, pharmacist and physician Glauber, like most of his contemporaries, believed in the possibility of turning base metals into gold and the existence of an elixir of life. Nevertheless, Glauber is one of those representatives of rational movements in alchemy whose significant experimental successes laid the foundations for scientific chemistry [2, p. 50].

Six years after Perrault's discovery, the famous German pharmacist, naturalist and master glassmaker, alchemist at the court of the Swedish king Charles XI, professor at the University of Wittenberg **Johann Kunkel** (Johannes Kunckel, Kunckel von Löwenstern; 1630, Wittenberg, Saxony-Anhalt – March 20, 1703, Stockholm) turned to coloring glass with gold – he called his method of producing red glass "golden ruby". In 1679, he wrote the book "Ars Vitraria Experimentalis oder vollkommene Glasmacher-Kunst" ("Experimental Art of Glassmaking"), but it does not contain a description of the manufacturing technique. The book was published in 1743 and became a bestseller; republished in 1789 in Nuremberg, after the death of the author.

In 1674, Friedrich Wilhelm, Elector of Brandenburg, founded a factory near Potsdam (known as the Potsdam Crystal Factory), where Kunkel was invited in 1678, where crystal glass was produced only according to his recipes. There, in 1684, Kunkel established the production of "golden ruby" glass – to obtain a red color, Kunkel introduced gold into it when melting the glass mass. He used Cassian purple as a source of gold, calling it "precipitatio Solis cum Iove."



Johann Kunkel.



JOHANNIS KUNCKELII,
Churfürstl. Brandenb. würcklich bestallt-geheimden Cammer-Dieners,
ARS VITRARIA
EXPERIMENTALIS,
Oder vollkommene
Glasmacher-Kunst/
Lehrende/
Als in einem, aus unbetrüglicher Erfahrung, herfliessendem Commentario, über die von dergleichen Arbeit beschriebene sieben Bücher P. Anthonii Neri, von Florentz, und denen darüber gethanen gelehrten Anmerckungen Christophori Merretti, M. D. & Societ. Reg. Britann. Socii,
(so aus den Italien- und Lateinischen beyde mit Fleiß ins Hochteutsche übersetzt)
Die allerkurtz-bündigsten Manieren, das reineste Chrystall-Glas; alle gefärbte oder tingirte Gläser; künstliche Edelstein oder Flüsse; Amausen, oder Schmeltze; Doubleten/ Spiegeln/ das Tropff-Glas; die schönste Ultramarin, Lacc- und andere nützliche Mahler-Farben; ingleichen wie die Saltze zu den allerreinesten Chrystallinen Gut/ nach der besten Weise an allen Orten Teutschlands mit geringer Mühe und Unkosten copieus und compendieus zu machen/ auch wie das Glas zu mehrer Perfection und Härte zu bringen. Nebst ausführlicher Erklärung aller zur Glaskunst gehörigen Materialien und Ingredienten; sonderlich der Zaffera und Magnesia &c. Anzeigung der nöthigsten Kunst- und Handgriffe; dienlichsten Instrumenta; bequemsten Gefässe/ auch nebst andern des Autoris sonderbaren Oefen/ und dergleichen mehr/ nützlichen in Kupffer gestochenen Figuren.
Samt einem II. Haupt-Theil.
So in drey unterschiedenen Büchern, und mehr als 200. Experimenten bestehet/ darinnen vom Glasmahlen/ vergulden und Brennen; vom Holländischen Kunst- und Berrellan-Töpffwerck; Vom kleinen Glasblasen mit der Lampen; Von einer Glas-Flaschen-Forme/ die sich viel 1000. mal verändern läßet; Wie Kräuter und Blumen in Silber abzugiessen; Wenig zu traotiren; Rare Spiel- und Face-Fürnisse; Türckisch Papier; &c. Item der vortreffliche Rubin Gold-Sträu-Glantz; und viel andere ungemeine Sachen zu machen/ gelehret werden/
Mit einem Anhange von denen Perlen und fast allen natürlichen Edelsteinen; Wobey auch in gewissen Tabellen eigentlich zu sehen/ wie sich die köstlichsten derselben nach dem Gewicht an ihren Preis verhalten/ und einem vollständigen Register.
Alles hin und wieder in dieser dritten Edition um ein merckliches vermehret.
Nürnberg/ in Verlegung Christoph Riegels/ Buchhändlers unter der Vesten. 1743.

Title page of the treatise "The Experimental Art of Glassmaking, or the Perfect Art of Glassmaking."

On Peacock Island (Pfaueninsel) on the Havel River, between Berlin and Potsdam, Friedrich Wilhelm created a laboratory for Kunkel, where the scientist developed glass compositions. At Kunkel's enterprise, various objects were made from "golden ruby" glass – cups, glasses, jugs, flasks (sulei). The glass had a blood-red color – because of this, Kunkel was accused of adding blood to it. Only Friedrich Wilhelm was able to save Kunkel from the Inquisition. The Natural History Cabinet of German Waldenburg (Saxony) houses several glasses produced at the Potsdam plant; two sulei are kept in Moscow in the Armory Chamber (apparently, they were brought to Russia under Peter the Great). After the death of Friedrich Wilhelm in 1688, Kunkel left Germany and the production of ruby glass temporarily ceased. Western European scientists claim that Kunkel took the secret of making a golden ruby to his grave. But the scientist himself pointed to the leak of the ruby glass recipe from the Potsdam plant, which explains the rapid spread of this technology in neighboring countries. It is believed that the method of making the "golden ruby" was rediscovered in the West in the 40s of the 19th century.

The production of ruby glass in Bavaria appears to date back to Kunkel's recipe. It was produced by workshops in Freiser and Munich (with 1690), which served the court of the Bavarian Elector Maximilian II [4, p. 265].

The chief technologist (Christallmeister) here was Hans Christoph Fiedler. The beginning of the production of red glass in Northern Bohemia in 1683 is also associated with the name of Fiedler, who visited the small court factory Juliustyl in Zakupi several times in 1688–1689 at the invitation of Julius Franz, the last Duke of Saxe-Lauenburg (Lower Saxony). The most famous of the southern Bohemian factories is the guta Helmbashka (Janushek), which was managed by the famous Czech technologist Michael Müller (1639–1709). It was here that in 1683 he began to produce chalk glass, and soon the "golden ruby". When creating his recipe for ruby glass, Müller probably used Fiedler's experience, although there is no evidence of their contacts. Saxony chose a special path in the production of ruby glass, where the famous Johann Friedrich Böttger worked on the recipe for its production. He experimented with glass in a factory in the suburbs of Dresden, competing with Kunkel [4, p. 143].



"Golden Ruby" by I. Kunkel. Treasury of the Residence, Munich. Waldenburg Kunkel glass, ca. 1700 (Au – 0.013).

Johann Friedrich Böttger (February 4, 1682, Schleitz – March 13, 1719, Dresden) – German alchemist and goldsmith (German: Goldschmied), the first European naturalist to obtain white porcelain in1708. Known as the inventor of European porcelain. He invented red jasper porcelain (German: rothes Porcelain) – opaque, hard ceramic that rings when tapped and can withstand high temperatures. Later, red porcelain began to be called "Böttger porcelain". The production of this porcelain became a state secret; the king did not lose hope that Böttger would discover the secret of making gold [5, p. 143].

In Russia, the production of "golden ruby" was first organized by Mikhail Vasilyevich Lomonosov. Mikhail Vasilyevich Lomonosov (November 8, 1711, Mishaninskaya, Arkhangelskaya Governorate – April 4, 1765, St. Petersburg) – the first major Russian natural scientist, physicist, chemist, encyclopedist – a striking example of a "universal man" (lat. homo universalis).

It is known that he knew how to make colored glass already in 1751. A note of his, dating from 1741–1743, has been preserved, where he quotes Kunkel: "150 pars 1 auri tingit 1280 partes vitri in rubinum". In his experiments, Lomonosov established that ruby glass acquires a brighter color with increasing gold concentration and higher temperature. Lomonosov conducted laboratory experiments on the production of colored glasses from 1748 to 1752. Most of the samples he received were smalt glasses for mosaics, interest in which was formed under the influence of Italian mosaics exported from Rome by Count M.L.Vorontsov in 1745–1746. Ruby glass was made in small quantities and used sparingly – it was very expensive. But M.V. Lomonosov's work on colored glass and gold ruby convinces us that he developed an independent method for producing ruby glasses colored by combining gold back in 1775. When developing such glass, Lomonosov turns to the book of I. Kunkel, to the recordings of Henkel's lectures, which he listened to in Freiberg. His colored mosaic panels are known all over the world. Obtaining a golden ruby was one of the most difficult problems solved by Lomonosov in the field of glass making. Ruby smalts M.V. Lomonosov stand apart in the history of Russian glassmaking [6, p. 525-527].

In Rus', glass was found in the form of beads back in the 13th century, but there were no glass factories at that time. The first Russian glass factory was built only in 1634 by the Swede Elisha Koeta. This factory produced tableware and apothecary utensils. In 1668, construction began on a glass factory in the village of Izmailovo near Moscow, which partially worked for export. Peter I patronized the development of glassmaking, hired German masters, and sent Russian craftsmen to study abroad. During the reign of Elizabeth Petrovna (1741–1761), there were already six glass factories near Moscow. In 1760, the Moscow merchant Maltsov received permission



Johann Glauberg



Johann Better

to set up a glass factory for the production of crystal and glassware, as well as mirror, carriage and window glass. This plant became the founder of the later known Maltsov plants.

Not a single Russian object made of transparent ruby glass, made in the mid-18th century, is known. The first products made of ruby glass date back to the 1780s, when the Potemkin plant began producing several types of "colored matter". The collection of the Hermitage (St. Petersburg) contains parts of Catherine's chandeliers of bright scarlet color, made of Russian glass; ceremonial tableware (glasses, glasses, trays) dating back to the 1790s. Recipes for melting ruby glass are given by Lieutenant I. Ya Goltvinsky, the chief overseer of the crystal factory in St. Petersburg, in the book "Instructions Based on Experiments," published in 1805. At the end of the 18th century in Russia, ruby glass was produced at the Imperial Glass Factory and some private enterprises. In addition, the Gus-Khrustalny factory, founded in the middle of the 18th century, became famous for its crystal, and for the fact that here, for the first time in Russia, they began to produce products from ruby glass (the production of which is based on the basis of English, lead crystal, the origin of which is associated with a stay in England in 1783–1788, master of the Potemkin plant Efrem Karamyshev).

In the 19th century, ruby glass was used in artistic glassmaking only in the form of color.

It is surprising that in the early 1820s of the 19th century in Chișinău it was possible to purchase objects made from this precious glass. It is known that in 1822, A.S. Pushkin (whom Russian Emperor Alexander the First sent to serve in Bessarabia instead of exile to Siberia for anti-government poetry) bought a travel set made of ruby glass with gilded edges in Chișinău at the Ilyinsky Bazaar, which consisted of a decanter with a ground-in stopper, four glasses and a tray with a rim. Pushkin kept it as a memory of Bessarabia where he lived for almost three years. He was with the poet in Odessa and during his exile to the family village of Mikhailovskoye. Pushkin did not part with this travel set for many years.

January 28, 1828, Alexander Sergeevich presented this relic to his older sister Olga on her wedding day, filling the decanter with his favorite Moldavian Madeira wine, diluted with water, as the Greeks did. In 1856, Olga Sergeevna gave this family heirloom to her son Lev Nikolaevich Pavlishchev, who, in turn, presented the decanter and one glass to the famous writer Ivan Leontyevich Leontyev (pseudonym Ivan Shcheglov). In 1911 literary critic Boris Lvovich Modzalevsky, according to the will of I.L. Leontiev handed over the decanter and one glass from the set to the Pushkin House (Institute of Russian Literature of the Russian Academy of Sciences).

The tray (broken on one side, with cracks) was transferred to the Pushkin House from the family of playwright V.F. Ryshkov in the same 1911.

The history of this device is outlined in a letter from Pushkin's nephew, Lev Nikolaevich Pavlishchev. "Pushkin... bought it along with accessories, namely, four glasses (three of them were later lost) and a tray in Chișinău, in 1822, when the poet was in the service of the Novorossiysk Governor-General Inzov as an official of the Trustee Committee for the Colonists southern Russia. From this decanter, my uncle poured his favorite Madeira wine into the same glasses for himself and his friends who visited him, and kept the whole device, as a memory of Chișinău, with himself, until the marriage in 1828 of his sister, my late mother. It was then that he gave her the said device on the occasion of her wedding, while filling the decanter with the same life-giving moisture beloved by the poet. Then the entire device – decanter, glasses and tray – was given to me by my mother, Olga Sergeevna Pavlishcheva, in 1856, when I graduated from a course of science at St. Petersburg University, the rector of which at that time was the poet's friend, the late Pyotr Aleksandrovich Pletnev. And I am happy that I could present this decanter to the highly respected Ivan Leontyevich – a sincere admirer of Pushkin, who has faded to glorious memory... 1902 Lev Pavlishchev" [7, p. 55].

Now Pushkin's travel set for wine, partially preserved (decanter, tray and one glass) is stored in in St. Petersburg, in the poet's last Apartment-Museum on Moika Embankment, 12.

In what country this amazingly beautiful travel set was created – in the West or in Russia, who its author is – is unknown. It dates back to around the beginning of the 19th century. This was, of course, an expensive purchase, especially for a young exiled official who received a small salary and was constantly in need of money.

In the archives of the House-Museum of A.S. Pushkin has dishes made of multi-colored glass from Pushkin's time. But objects made of ruby glass occupy a special place - there are not many of them. The exposition of the memorial visiting house, where the young poet stayed when he arrived in Chișinău on September 21, 1820, presents a set of ruby glass, consisting of a set of ruby glass, but for spices, consisting of four items: a salt shaker, a pepper shaker, a vinegar shaker, dating back to the beginning of the 19th century, which is of historical and literary value. This set reminds us of Pushkin and suggests that in Chișinău in the 1820s it was possible to purchase such an expensive and valuable item. This is not surprising if we remember that Chisinau was "at the crossroads of all the roads of Asia and Europe," and this city was called "Babylon in miniature," according to numerous foreign travelers who came here.



Mosaic icon by M.V. Lomonosov.1752



M.V. Lomonosov

Personal belongings of the great man (or at least a little similar to them) help to understand certain moments of his biography, study his life more deeply, and touch on the secrets of his work. The emotional impact of these things on numerous visitors to museums and exhibitions is extremely great.



Decanter, glass and tray from a ruby glass set purchased by A.S. Pushkin in Chişinău. The last apartment-museum of A.S. Pushkin, St. Petersburg.

Bibliography:

1. Freestone, I.; Meeks, N.; Sax, M.; Higgitt, C. *The Licurgus cup – a roman nanotechnology*. Gold Bulletin, 2007, v. 40, n. 4, p. 270-277.

2. Drozdov, A.A.; Andreev, M.N. *Glass "golden ruby" – history of creation and analysis of historical compositions. History and pedagogy of natural science.* M., 2018, No. 4, p. 49-55.

3. Kunkel, Johann. *Encyclopedic Dictionary of Brockhaus and Efron in 86 volumes*. St. Petersburg, 1890–1907.

4. Drahotova O. *European glass*, Artia, Prague, 1983, p. 143.

5. Böttger, Johann. *Encyclopedic Dictionary of Brockhaus and Efron in 86 volumes.* St. Petersburg, 1890–1907.

6. Bezborodov, M.A. *"Golden Ruby" M.V. Lomonosov* // Dokl. Academy of Sciences of the USSR. 1946. T. LI, no. 7, p. 525-527.

7. *Pushkin and his contemporaries. Materials and research*. M., L., 1956–1988, vol. 1-XIII. T. 1X, p. 55.



Ruby glass set – exhibit from the collections of the A.S. House Museum Pushkin.