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Original Research Article

Recognizing the Correspondence of Alchemy and Sacred Art in Iran by Studying Luster-Ware Mihrabs*

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Abstract

Problem statement: The basis of alchemy, contrary to what is presented to people today, has mystical aspects and without mysticism, alchemy is no longer considered alchemy. Alchemy is associated with mysticism in monotheistic religions and has been of great value in Islam. Mysticism is the source of Islamic sacred art and historically it has had a deep relation with alchemy. Among the sacred arts luster-ware mihrab is one of the most comprehensive examples. In the art of Luster-ware, a worthless brick is transformed into a tile with a luster-ware resplendence by performing an operation that corresponds to an alchemy allegorical action which is the transformation of a base metal into gold. This correspondence, along with the union between Islamic mysticism and alchemy, suggests the importance of alchemy in the structure of sacred art, especially in luster-ware mihrabs. The Main Question is what role did alchemy play in shaping the luster-ware mihrabs and how are the symbols of alchemy in these works manifested

Research objective: The main purpose of this article is to explain the importance of alchemy, as wisdom related to Islamic mysticism, in the decoration of the luster-ware mihrabs.

Research method: In this research, due to its historical nature, library resources are used and a comparative study of luster-ware mihrabs as one of the most comprehensive sacred works in the Islamic art of Iran, is conducted with symbols of alchemy in a descriptive-analytical manner.

Conclusion: By visually studying the luster-ware mihrabs, the effects of alchemy as an ancient mysticism in Islamic art of Iran can be observed. The concepts of alchemy have appeared in the visual form of the luster-ware mihrabs, with a cryptic expression and in the form of overt and covert symbols. These symbols, like alchemy itself, have a thematic scope. Alchemical symbols, laws of reflection and duality, geometric motifs such as circle, square, seal of Solomon and the figure of snake are among the symbols that reveal the connection between the luster-ware mihrabs and alchemy mysticism and also show the presence of alchemy in the visual system of Islamic sacred art.

Keywords: *Alchemy, Sacred Art, Luster-ware Mihrabs, Islamic Art of Iran.*

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Introduction

The principles of alchemy are very similar to Islamic mysticism. One of these principles is the concept of transformation in alchemy, which puts perception in direct contact with the divine ray and stimulates the desire for connection in human beings (Burkhardt, 2009, 83). “Hassan Ibn Zahid Kermani”, a scientist of the eighth century A.H., considers alchemy to be a knowledge of divine origin, the basic teachings of which have been revealed to the prophets. In his view, the practice of allegory by which alchemists have extended their teachings is very important. As alchemy is the middle world, which is similar to the other two worlds, the greater world (material world) and the lower world (human) (cited in Moghaddam Heydari & Kavousi Rahim, 2016, 205). Also, some Muslim mystics, known as alchemists had alchemy treatises; Like “Hussein Ibn Mansour Hallaj”, the author of treatises such as “Fi Al-Aksir” and “Fi Al-Kimiya” (9th century A.D.) and “Maulana Kamaluddin Hussein Wa’ez Kashefi”, the author of “Asrar Qasemi” (15th century A.D.). In Islamic hadiths and narrations, alchemy has been mentioned properly and has been distinguished from other branches of Occult sciences. As in the Islamic period, alchemists rarely used the word “alchemy” to name it and by relying on a quote from “Amir al-Mu’minin”, they called it “Ukhtu al-Nabuwwat”, “Ummu al-Futuwwat”, “Esmatu al-Muruwwat” (Kouhkan, 2016, 102). In alchemy, gold is a symbol of the perfect man for the alchemist turns material into gold by purifying it and removing any contamination from it. In mysticism as well the human soul must be separated from any belonging that has caused pollution and captivity to be able to reach its perfection, that is, the connection to the eternal truth.

The sacred Islamic art is based on the teachings of the Qur’an, the life of the Prophet and Islamic mysticism. Meanwhile, Islamic mysticism has two other principles and plays an important role in the formation of the spiritual and visual system of sacred art. From the heart of various mystics due to their spiritual truth, certain arts have grown. In Islam, the divine truth and its apparent embodiment is in the

Qur’an (Dadvar & Dalai, 2016, 37). For this reason, calligraphy of Quranic verses is the highest form of sacred art (Bayadar & Towfiqi, 2014, 167). In Islamic sacred arts, such as the book of Quranic manuscripts and the architecture of holy buildings, calligraphy is used along with Arabesque decorative designs. On the other hand, the mihrab, which is the smallest semantic unit of the mosque and its spiritual heart (Abbasi, 2013, 274), carries the main decorations of sacred art, namely Quranic inscriptions and Arabesque decorative designs. These features make the mihrab one of the most comprehensive examples of the study of sacred Islamic art among the works of sacred art.

The reason for selecting the luster-ware mihrabs in this research, in addition to the importance of the mihrab among the works of sacred art, is the special technical and spiritual characteristics of luster-ware and the connection of this art with alchemical thinking. The effect of alchemy and its mystical concepts on the visual system of luster-ware mihrabs is the focus of the research and the purpose of this study is to define the contribution of alchemy to the decorations of luster-ware mihrabs. Muslim artists seem to have used alchemy because of its mystical aspect and cryptic language to better understand spirituality in the structure of sacred works such as the luster-ware mihrabs.

Research background

Among scholars, the view that Titus Burkhardt (2009) as a traditionalist who valued the sacred aspect of art is of interest to alchemy. In *Alchemy: In The books “Science of the World, Science of the Soul”*, Burkhardt compare alchemy to mysticism as a way to bring man to his knowledge and perfection, calling it a sacred art thereafter, Kouhkan, in his book “*Chemical Thought of Bughrai*” based on Bughrai Isfahani works, examines the characteristics of alchemy and emphasizes the importance of the exclusive and cryptic aspect of this science (Kouhkan, 2015).

Some scholars Abbas Abed Esfahani and Parviz Holakouee (2006) have studied luster-ware techniques based on the instructions obtained from ancient treatises. In his doctoral dissertation, Rouhfar (2009)

studied the characteristics of luster-ware glazing techniques based on the instructions of “Abolghasem Abdullah Kashani”’s dissertation and found that the Kashani family, in addition to producing luster-ware works, also invented technical methods.

Around the discussion of luster-ware mihrabs, Robab Faghfoori and Hassan Bolkhari Ghahi (2014) in an article entitled “Manifestation of Islamic Wisdom in the Structure and Themes of the luster-ware mihrab of the Holy Shrine of Razavi” conducted a structural and thematic analysis of the decorative arrays of the mihrabs of the shrine Razavi and introduced these mihrabs as the symbol showing the peak of Islamic art and one of the examples of sacred art in Islamic architecture.

Salmani and Chatrbahr (2016), in their article “Comparative Methodology of Studying Islamic Art (with Emphasis on the Case Study of the mihrab)”, have made a comparative study between two common methods in analyzing works of Islamic art to explain the validity of following methods: first the traditionalist method; it emphasizes the transcendental truths of Islam and the historical method, which looks at geographical, indigenous and temporal factors instead of merely emphasizing transcendental affairs. This comparative study has been done to evaluate these two views about the mihrab. The authors argue that although both attitudes have distinctive features, to reach a consensus on all the features of Islamic works of art, especially the mihrab, it is necessary to use both methods of research since merely paying attention to traditionalist principles cause ignoring the artist’s sensory motivations and relying only on a historical aspect causes to ignoring the facts and spirituality behind each symbol which may play a role in the process of turning the mihrab into a symbol in Islamic architecture (Salmani & Chatrbahr, 2016).

Salmani Qazvini (2017) in her article “Study of the decorations of the mihrab of the Ilkhanid era”, examined the decorative motifs of the mihrab and in a part of the article talked about the art of tiling of the Ilkhanid period and highlighted the importance of luster-ware mihrabs. The book of “Pottery Mihrabs”, which is the result of Mo’taghehi’s (2018) research, is

also important in terms of the existence of high-quality images of mihrabs collected from various museums around the world. Especially since most of this book is dedicated to the introduction of luster-ware mihrabs. In this regard, Zohdi and Farrokhfar (2018) in his article entitled “Analysis of thematic, visual and structural features in the luster-ware mihrabs of the Ilkhanid period”, visually described the thirteen luster-ware mihrabs belonging to the Ilkhanid period and examined the themes and structure of the decorations of this Mihrab. In this article, the authors, while emphasizing the Quranic themes of the inscriptions, consider the decorations of these mihrabs to include inscriptions, plant motifs and geometric motifs; however, they have not studied the meanings of the designs or the spiritual aspect of the mihrabs.

In recent years, a treatise attributed to “Jabir ibn Hayyan”, entitled “al-Durra al-Meknuna” has been found, which is very important in estimating the background of luster-ware technique and compiling its instructions. In their article, Shokrpur and Mirshafiee (2019) have explained the instructions and special materials for luster-ware on glass that are mentioned in this treatise. Although the authors in this article have only introduced the instructions and interpreted some terms of the treatise in “al-Durra al-Meknuna”, it is a notable research. the introduction of “al-Durra al-Meknuna” as one of the treatises of “Jabir ibn Hayyan” helps to clarify the history of luster-ware as the oldest treatise found in this field and also strengthens the connection between the alchemists and the tile makers of luster-ware for “Jaber” has been more famous in alchemy than any other science.

Examining previous research, the connection between alchemy and mysticism is obvious and on the other hand, the importance of luster-ware mihrabs as one of the pure manifestations of Islamic art has been emphasized. Given that in previous studies, luster-ware mihrabs has not been studied in terms of chemical effects, the issue distinguishes the present article from previous studies. This study as a novel look at alchemy is verified as a factor influencing the structure of the luster-ware mihrabs. In the present

article, the study of luster-ware mihrabs as one of the most important semantic units in the sacred art is done and by examining the symbols and signs of alchemy in these samples, the role of alchemy in the formation of the luster-ware mihrabs and consequently the sacred art of Islam is described.

Theoretical foundations

• Alchemy

Occult sciences include sciences that deal with transcendental affairs and alchemy is its most important branch. The expression of alchemy is mysterious and its ultimate goal has been to achieve spiritual perfection. The basis of alchemy is based on revelatory, symbolic and enigmatic principles (Kouhkan, 2015) and alchemical symbols are a collection of words, actions, allusions and names. Alchemists paved the way for many sciences in their discovery and intuition (Moran, 2011, 301). Psychology, literature, pharmacy, chemistry and astronomy are some of the sciences derived from ancient alchemy in which chemical symbols can be searched. In the past, various goals for alchemy were enumerated: the conversion of metal into gold, the preparation of the elixir of youth and the attainment of true knowledge, which in all purposes, even in material and the attainment of gold, the aspect of monasticism and spirituality of the alchemy take precedence over the materialistic aspect. Gold and silver were considered sacred metals before they became a symbol of wealth; Therefore, it cannot be acknowledged that the reason for the survival of alchemy for thousands of years in different civilizations of the East and the West is the temptation of wealth like minting gold and silver coins, which was a special privilege for sacred places (Burkhardt, 2009, 11-16). In fact, the real purpose of alchemy was not to convert low metals into gold and if alchemists had sought such conversion, they would not have succeeded. The real purpose of alchemy is to see the connection between the soul and the world and to discover the inner horizons of human existence that are connected with the soul of the universe (Gharagozli, 2010, 58).

Hermes was the first alchemist to be known by the letters of Enoch, Hermes Trismegistus, Thoth, Houshang, and Idris in various myths and religions. The Emerald Tablet contains his teachings, which were revered among the alchemists of history. Everything that is above is from that which is below, and that which is below is from that which is above, and such a miracle of unity emerges, it is a law that is written on this tablet (Seligman, 1998, 187). This law, which is also known as the principle of reflection, is known in Islamic mysticism as the manifestation of the greater world in the lesser world. Also, according to the rules of this tablet, everything arises from the unit and through meditation on the unit, which can be interpreted as the concept of unity in the multiplicity of Islamic thought.

• Luster-ware mihrabs, the manifestation of sacred art

Just as the goal of alchemy is to achieve perfection through the balance of opposites, so is man's journey to eternal truth and becoming a perfect human being the mission of sacred art. Sacred art is a part of traditional art that has a strong connection with spirituality; because it expresses manifestations that go directly back to the spiritual foundations of tradition (Mehrpooya & Ghasemi, 2008, 12).

The sacred arts with appearances and decorations appropriate to any religion, renews; For example, holiness is manifested in Christian art in accordance with the idea of embodying Christ in the form of paintings or sculptures and in Islamic art in the form of abstraction. In Islamic art, saints are manifested in calligraphy, book decoration and architecture. Architecture is the most comprehensive of them since it contains other sacred arts such as gilding and calligraphy of verses and hadiths and is considered as a summary of Islamic sacred arts. Architecture includes various components such as pulpit, mihrab, porch, spire, etc., among which the mihrab is the smallest and most important semantic unit in architecture (Abbasi, 2013, 274).

Among the methods of decorating the mihrab (plastering, carving, various tiles, etc.), luster-ware glaze is one of the most special and mysterious methods. Luster-ware is a transformation of pottery clay into metal tiles with

luster-ware and shiny sheen; like the allegorical goal of an alchemist who turns a low object into precious gold. The use of precious materials and sophisticated techniques of luster-ware has caused the luster-ware specimens to be limited only to mihrabs or small spaces in Islamic architecture and on the other hand, are dedicated to the most important and sacred Islamic buildings such as the shrines of Imams, Imamzadehs and mosques. Some of the most important luster-ware mihrabs are: the three mihrabs of “Astan Quds Razavi Mashhad” (13th century A.D.), the mihrab of “Imamzadeh Habib ibn Musa” in Kashan (13th century A.D.), the mihrab of “Emad al-Din Mosque” in Sang Square of Kashan (13th century A.D.) and the mihrab of “Imamzadeh Ali ibn Ja’far” in Qom (14th century A.D.) who is known as “Bab-e Behesht”.

Methodology

There are various research methods for studying Islamic art, the most important of which are mystical and historical methods. One of the most important intellectual attitudes about Islamic art is the views of traditionalists who look at Islamic art through a mystical lens. Belief in the wisdom of the creator, or eternal wisdom, the transcendent unity of religions and the tendency to mysticism are the characteristics of this thinking. Traditionalists consider traditional art to be the assurance of human well-being redemption and the key to the success of contemporary mankind is the return to the religious traditions and truths of the divine religions. Considering the importance of the aspect of the sanctity of art and its relationship with the ancient sciences in this study, Islamic art is examined with a traditionalist approach; because the works of these philosophers, especially “Seyyed Hossein Nasr” and “Titus Burkhardt”, have been based on the relationship between art and cosmological sciences.

To understand the effects of alchemy on sacred art, the luster-ware mihrabs are selected as an example. In this comparative study, the number of samples is estimated to be twenty-six luster-ware mihrabs tablets. The reasons for choosing the mihrab as a representative of the visual effect of the sacred art in this study are

as follows: 1. The mosque is a sacred Islamic building and although it does not seem to have a center, it causes a spiritual concentration in the mosque for Muslims to pray and worship; 2. The symbol of the spiritual centrality in the mosque is the mihrab. The mihrab is a structure which determines the direction of the Qibla, the center of the prayer lines and the location of the prayer. In some mosques, in addition to the main mihrab, there are smaller mihrabs in different places, which are the places of worship of the believers; therefore, from a mystical point of view, the mihrab is a pre-eminent place for spiritual connection; 3. The mihrab is the most important mystical symbol of the mosque, it is decorated with inscriptions of Quranic verses and it also has Arabesque decorative designs in the book of Quranic manuscripts; 4. Luster-ware coating is one of the most special and mysterious unique methods in the art of Islamic glassmaking and pottery. The conversion of worthless bricks into metallic polishes is a process similar to the allegorical act of alchemy. [Fig. 1](#) summarizes the course of the research.

Discussion

The connection between mysticism and alchemy is obvious throughout history; from common principles, goals and customs to famous scholars and sages who were famous in both mysticism and alchemy, they all prove this connection. Mysticism is intertwined with the sacred art of Islam and alchemy, mysticism and the sacred art of Islam are interrelated to each other. In this comparative study, first, the correspondence of alchemy and the luster-ware mihrabs is discussed in the instructions and consumables, then the visual structure of the luster-ware mihrabs and their correspondence with the symbols of alchemy are examined.

• Instructions and consuming materials

In examining the characteristics such as materials, tools and chemical processes in alchemy and the process of making luster-ware glazes, the relationship between these two areas becomes clear. Existence of detailed instructions for making pottery in the sources of alchemy and chemical terms in pottery texts are among the factors that strengthen the connection

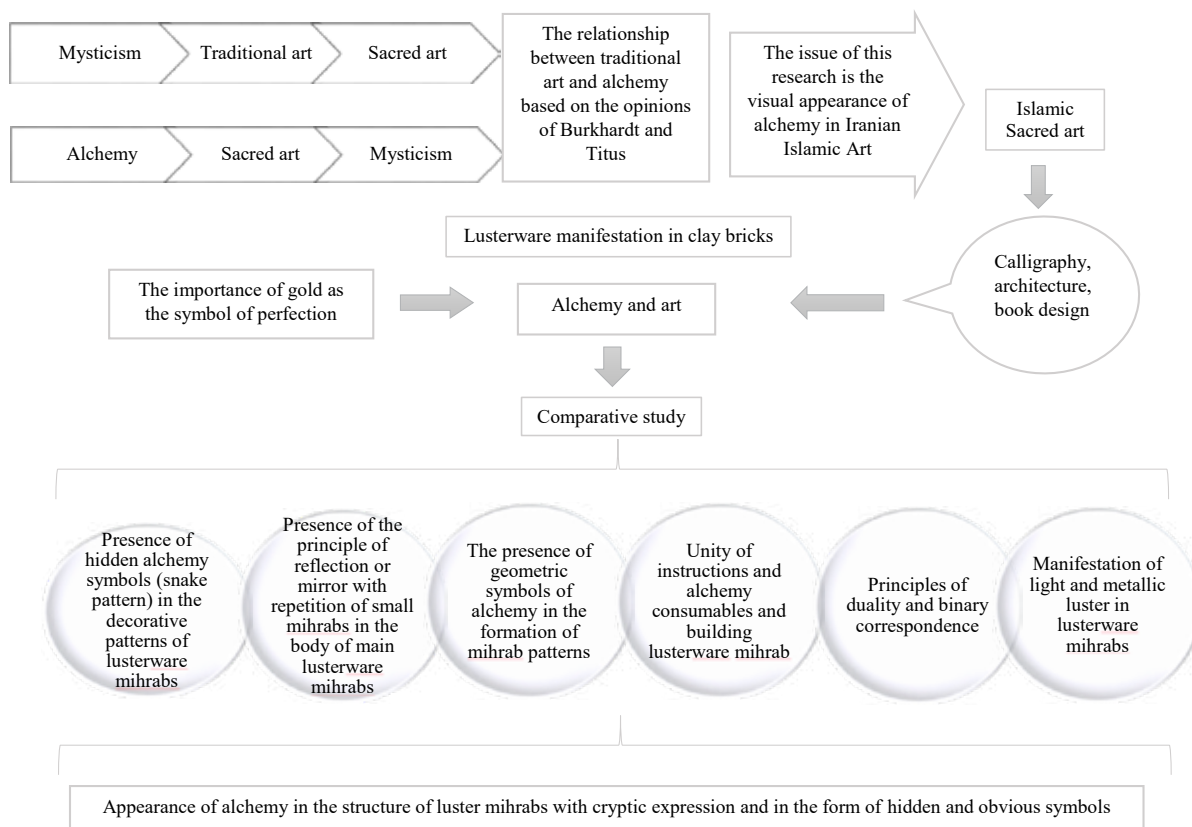


Fig. 1. The process of selecting the luster-ware mihrabs. Source: authors.

between these two fields. In general, it can be said that alchemists were familiar with the techniques of pottery and the potter was also familiar with the knowledge of alchemy. For example, one of the basic characteristics of sacred art is the teaching of techniques person to person, which is also a principle in alchemy. Burkhardt defines alchemy as a sacred art in which beginning in writing has caused it to decline. He describes sacred art in terms of an internal process aimed at maturing, transforming, or reborn the artist’s own soul; the same steps emphasized in alchemy to reach perfection (Burkhardt, 2009, 20).

Consumables have been very important in Islamic Art. Apart from climatic and economic conditions, attention has been paid to the inherent quality of each substance consumed and its degrees of existence in terms of spiritual effects. The necessity of purifying matter from any pollution and the inherent quality of matter in alchemy is also one of the principles (Ardalan & Bakhtiar, 2015, 18). There are similarities

between the ingredients used in alchemy and lusterware. The seven metals: gold, silver, copper, iron, tin, lead and zinc are the basis of alchemy. The two elements of mercury and sulfur also have an important and decisive role (Kouhkan & Joharchi 2019, 313). In the instructions of luster-ware, some materials are also fixed, such as iron oxide, copper compounds, silver and sulfur compounds, which in regenerative furnace cooking and by cellulosic materials, create a shiny layer of metal color on the base glaze (Rouhfar, 2009, 154). In luster-ware instructions, various factors cause color variation in luster-ware glazes, including the ratio of material composition, furnace temperature, regeneration time, furnace cooling time and tile texture. These points are also considered as practical methods in alchemy.

The most important element in alchemy is the furnace, or fire (Gharagozli, 2010, 58). In the lusterware process, the type of furnace and the method of heating are also very important. Thus, the furnace,

as a means of purifying and transforming materials, plays an essential role in both areas. In the luster-ware method, a coating of a combination of metal oxides, clay and acidic substances such as vinegar is coated on the tile surface and then placed in a special reduction furnace. When the temperature of the furnace reaches the required level, combustible materials such as wood are added to the space inside the furnace, which causes a fire. At the same time, all the holes in the furnace are closed to prevent oxygen from entering the furnace. As a result, the fire burns the mixed oxygen in the material on the tiles to keep it burning. Thus, oxygen is separated from the metal oxides and a thin layer of metal remains on the tile (Abed Esfahani & Holakouee, 2006). The separation of oxygen from the composition of the material and the attainment of the luster-ware layers in the mihrab tiles are reminiscent of the transformation of matter into alchemy and its transformation into a higher nature.

“Composition and Decomposition” is one of the alchemical terms, which means the two processes of unification and separation (from impurities) and refers to the stages that each substance goes through to achieve perfection (Seligman, 1998, 187). In general, chemical concepts and symbols are interpreted in binary forms. Fig. 2 shows some of the different binary correspondences in alchemy. According to the law of duality in alchemy, chemical marriage is formed when substances are united in binary proportions and combined in such a way as to achieve balance in all directions. For example, in the union of fire and water, fire becomes fluid and water becomes fiery, static water and its fire are refracted (Burkhardt, 2009, 84). “Composition and Decomposition” is the correspondence of two actions that are meaningful to

each other in chemical thinking. The ultimate goal of dual correspondence or the principle of duality is to achieve unity or perfection (See Fig. 2).

• **Composition and motifs**

The general design of the luster-ware mihrabs is similar to other mihrabs and they have divisions in the general composition for the placement of motifs and inscriptions. Among some mihrabs, the pattern of a candle can be seen. In the general plan of framing, smaller mihrabs are drawn in the heart of the main mihrab and usually, two to three mihrabs are seen in the heart, which are distinguished from the rest of the composition by two prominent columns and above them, prominent capitals are decorated with vases and Islamic motifs. The whole space of the mihrabs covered with regenerative glaze and the decorations are everywhere, even in the background of the decorative motifs so that the empty space does not remain in the mihrab.

The mihrab along with the borderline designs that separate each section in the form of frames and borders are transformed into a multi-layered space with the help of geometric divisions, which, the variety and difference of decorations in each section contribute to this distinction. Their surface has inscriptions in Kufic script, Sol’s script, manuscripts that have themes such as the great names of God, Quranic verses, hadiths and finally the names of the person who ordered and made it. The inscriptions on the mihrab are also interconnected; the audience should start reading from the bottom right margin, turn their eyes upwards and look down from the left margin again. Turning the viewer’s gaze after the writings is the induction of infinity and immortality; like a circle that symbolizes the eternity and stability of the moment in real time. In


	Sulfur	sun	Heaven	male	Kiln	circle	Active	Dryness	Soul	Mars
	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
	Mercury	moon	earth	female	Furnace	square	Passive	Wetness	Material	Hesperus

Fig. 2. Duality or correspondence in the concepts of alchemy. Source: authors.

the luster-ware mihrabs, the predominant decorations are the same as the inscriptions and plant Islamic patterns and the geometry is seen in the form of proportions and general composition.

In Islamic art, numbers and geometric shapes have been illustrative of the order and system of the world and the symbol of the word of ideas (Balkhari Ghahi, 2015, 237). In both sacred art and alchemy, the “triangle” is a symbol of the threefold connection of soul, ego and spirit, the “square” is a symbol of the four natures, four directions and four elements and the “circle” is a symbol of spirituality (Burkhardt, 2009). The most complete shapes are sphere (in space) and circle (in surface); Because in the circle the distance from the center point to all the surrounding points is equal (Bolkhari Ghahi, 2015, 357) and in addition to being the best symbol of unity in plurality, a comparison of the aggregation of opposites such as stillness and motion, unity and plurality, aggregation and subtraction to It has the most balanced shape possible. The characteristics attributed to God in Islamic wisdom and after that to the perfect man are likened to a circle in traditional teachings. In Islamic art, the circle with the snail movement of the Arabesque design shows the destination towards perfection and unity, which are the most dominant decorative motifs in the luster-ware mihrabs after inscriptions. In alchemy likewise, the circle is a symbol of perfection; because the sun and gold, which are in the seventh and highest degree in their group, are represented by the symbol of a circle whose central point is highlighted (Burkhardt, 2009, 89).

In alchemy, the universe is a living being whose all components are related and influenced by each other and coordinated (Kalbasi Ashtari & Pashayi, 2017, 40). The goal of everything in nature has always been to move towards perfection. All elements in nature go slowly and perfectly over time, then decline and become a low element again. Gold is perfection of metals that does not burn in fire does not disappear with melting, does not rust and does not see any shortcomings over time (Seligman, 1998, 188-189). This cycle is represented by the image of a snake

holding its tail in its mouth. This symbol shows the growth cycle as the return and ascending course of beings towards their origin and perfection and vice versa. This snake, which sometimes appears in the images and narratives of alchemy, in the form of a small snake in the alchemists’ alembic, is the same snake that causes man to be expelled from heaven and is a sign of his desire to know and is called “Orobrus” in alchemy. Be. In this symbol, in addition to circular motion, the concept of duality is emphasized by dividing the body of the snake into two parts, light and dark, which includes concepts such as good and bad connection, perfection and imperfection in the essence of each substance (ibid., 196). The image of the stick of Hermes or “Caduceus”, around which two snakes are wrapped, is another symbol of alchemy in the snake body (Fig. 3).

In the luster-ware mihrabs, the arch provided a wider part for decoration and the motifs that are seen in it are of great visual importance. The rhythm of the Islamic



Fig. 3. A) Ouroboros. Source: Assman, 2019, 30. B) Statue of Hermes and his staff, Caduceus. Source: Orbaton, 2018, 7.

openings and entanglements of patterns in this part of the mihrab is reminiscent of the principle of duality as well as the old tradition of dissolving and contracting in alchemy. This beat, which is drawn in the form of a twin spiral, can be visualized as two snakes wrapped around a pillar, a stick, a cane, or a tree. In Fig. 4, the Arabesque pattern movements of the arch section are depicted in the form of a snake. Of course, the Islamic resemblance between the movement of the snake and the Islamic patterns is obvious and there is a type of Islamic pattern which is also known in Islamic art as the mouth of the torpedo, that confirms this closeness; But the type of combination of the Islamic pattern in the arch of the luster-ware mihrabs is reminiscent of two snakes wrapped around the vertical axis of symmetry, as the pattern of “Caduceus”. Also, the circular and closed shapes of Arabesque patterns around it look like the movement of “Ouroboros”.

The two triangular shapes that form on both sides of the arch of the mihrab facade are called gusset and are filled with Islamic motifs, leaves and floral patterns. In some luster-ware mihrabs, two domes are embedded in the gussets. These domes can be seen in other types of mihrabs and the way of visualizing these two domes has been done in three ways: one is completely prominent and convex which is not seen in luster-ware mihrabs but its obvious samples are available in the stone mihrabs

of Maymeh of Isfahan and Mir Natanz; The second is hollow and concave, with no figure used in the empty space of the dome. Third, creating a dome design with the help of special designs in the gusset part. The two circular spaces in the bends of the mihrab symbolize light; Because in the past, these domes were known as a place for tallow light and in some gussets, instead of embedding the dome hole, lotus flower, which is considered a symbol of sun and light in Islam, has been used to show the dome area (Kameli & Aminpoor, 2017, 68). Usually, in Mihrabs that have these two domes in different forms (whether recessed, embossed, or engraved), the picture of a chandelier in the middle of these two domes is seen lower and in the shape of a hanging from three chains. The chandelier image is found in most of the luster-ware mihrabs and has been a clear symbol of light and brightness. The chandeliers were usually embossed and decorated with geometric ornaments or Islamic motifs.

These three symbols of light (two domes and lamp) control and direct the movement of the eye along an inverted triangle in the arch of the mihrab; It is reminiscent of the triads of “soul-ego-spirit”, “monotheism - prophecy - resurrection”, “shari’at-Tariqat-Haqiqat” and “phenomenal world-world of ideas-world of spirits” in Islamic mysticism. Considering that the builders of the luster-ware

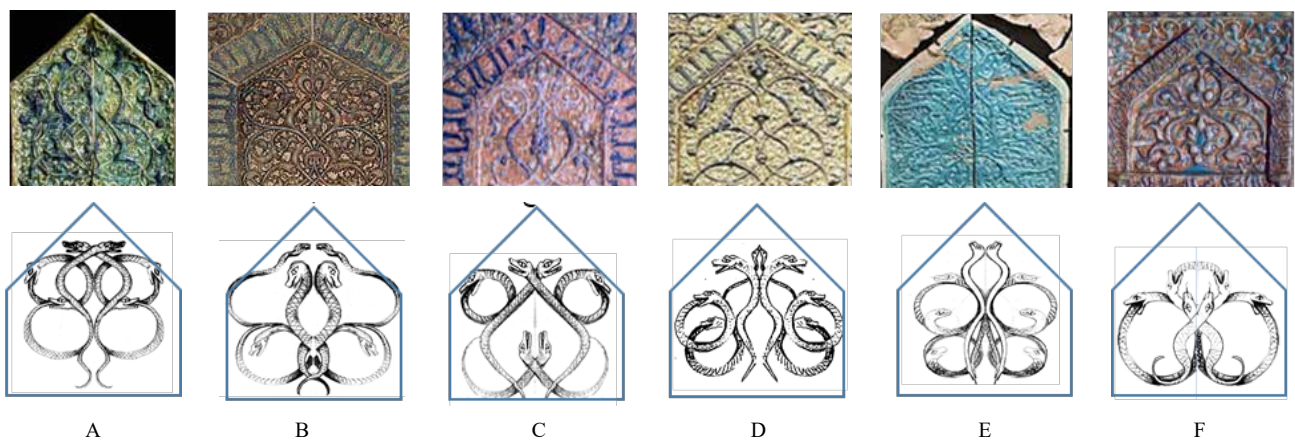


Fig. 4. The resemblance of the Islamists in the central arch of the luster-ware mihrabs with the symbols of Caduceus and Ouroboros in alchemy. Source: authors.
 A) The luster-ware mihrab of Imamzadeh Habib Ibn Musa, Museum of the Islamic era. B) The mihrab of Sarab Grand Mosque. C) The luster-ware mihrab of Emad al-Din Mosque, Sang Square, Kashan, kept in the Islamic Museum of Berlin. D) Mihrab of Bab Behesht, Museum of the Islamic Era. E) Mihrab of Imamzadeh Yahya Varamin. F) luster-ware mihrab in the collection of David.

mihirabs were Shia religious, the concept of this triangle can be considered based on Shia thought, the triangle of “Allah-Muhammad-Ali” (Rouhfar, 2009, 202). As shown in Fig. 5, these three symbols guide visual motion in the form of a downward triangle. This triangle, along with the arch on which it is placed, resembles a shape similar to the star of Solomon. The star of Solomon is one of the most important symbols in alchemy, which represents the four elements and the balance of opposites.

Alchemists were known to be professional in playing with words and cryptography and in symbolic alchemy treatises, they used symbolic symbols for keywords. Regarding the decryption of these signs, they claimed that they had clearly hidden the secrets. This means that the secrets, while visible, not everyone is able to understand or discover them (Martin, 2006, 35). This was done by alchemists for a number of reasons. First, it became difficult to decipher and read chemical commands by turning the word into a symbol and not everyone could understand it. On the other hand, by using geometric shapes, they summarized the meaning and energy of each word and gave it a transcendental force; another is that alchemy treatises are full of allegories and ambiguities. By turning the word into a sign, the alchemist could better express his intentions because some concepts in the form of words were numerous but in the sign, they became one (Burkhardt, 2009, 169). In the study of the luster-ware mihrabs, some of these signs can be seen among the decorations, inscriptions on the margins, or the

design of the chandelier. Table 1 lists some of these signs observed in the mihrab. The difference between the use of these symbols in the mihrab and other alchemical symbols is their obvious and independent appearance. This may indicate that their creators were influenced by alchemy.











In alchemy, light is a symbol of absolute perfection and is embodied in the form of gold and its luster. In verse 174 of Surah Nisa’1, the verses of the Qur’an are likened to “clear light”. The Qur’anic inscriptions surrounding the mihrabs, have flooded them with light. In the luster-ware mihrabs, in addition to the spiritual shining of Quranic verses, we also see the sparkle and metallic luster of colors. As the practice of alchemy is known as the conversion of base metals into precious gold; In the process of luster-ware, the clay is turned into a tile with a metallic sheen. Maturity of colors, more reflection of light and consequently gloss of the tile surface are the differences that are evident in luster-ware glaze compared to other glazing methods. Gold, sun and light are interrelated and important elements in alchemy.

Colors are obtained from the order of light. Just as light in its pure state is a symbol of the divine essence, colors are also a symbol of various aspects of existence (Ardalan & Bakhtiar, 2015, 17). In addition to the gloss of the metal colors, the contrast of the colors also causes the golden and light colors to shine more. Color contrast can be seen in different parts of the mihrab (arches, margins and frames). The reason for using color contrast in inscriptions, which are often written in



Fig. 5. The trinity of two domes and a chandelier in the luster-ware mihrabs, merging with the arc triangle and forming the seal of Solomon. Source: authors.

Table 1. Chemical symbols in the designs of luster-ware mihrabs. Source: authors. Source of the signs of alchemy in the table: Ludy, 1928 and Source of the details of the mihrabs: Mo'taghedhi, 2018.

Symbol	The concept of alchemy	Mihrab image	Position	Result
	Mercury or the main substance that is the source of all elements.		It is in the center of the mihrab and shows the chandelier hanging with three chains.	Although some of these symbols were seen only in a mihrab, the direct observation of an alchemical symbol in the mihrab is the result of the creators' acquaintance with the science of alchemy and its importance.
	Gold or the sun, which is a symbol of perfection and absolute light.		Used to decorate the background of the main motifs.	
	The cross symbolizes the four elements and the four main directions.		It can be seen in the upper corner of the mihrab.	
	In the symmetrical reflection state, it means time.		Used to decorate the body of the chandelier	
	It means the act of confrontation or reflection.		Used in the background decoration of the main motifs.	

white on a dark background, is to show the dominance of light over darkness, which is seen by increasing the white space on a dark background (Imeni, 2010, 90). In addition to the color contrast, the positive and negative spaces in Islamic tiles that indicate the union of soul and body is a correspondence that reminds the principle of duality in alchemy.

Three types of symmetry can be observed in Islamic art: one is the transitional symmetry, which is the simplest type and the pattern is repeated without change in size or direction. The other is a rotational symmetry in which the pattern is repeated with a circular motion around a point with a change in angle. The third type is the reflective symmetry in which the repetition is performed around a vertical or horizontal axis (Keshavarzi & Ahmadi Sheykhan, 2010, 29). In the luster-ware mihrab, in the composition of the motifs, the reflective symmetry is observed abundantly as symmetry based on the vertical axis. This feature

is also observed in the Qur'anic inscriptions in the margins around the mihrab. By elongating the letters and adjusting the rhythm of the words next to each other, balance and equilibrium are maintained on both sides of the hypothetical symmetrical axis. In the luster-ware mihrabs, the Eslimis are also engraved according to the hypothetical axis of symmetry.

“Traditional art and architecture are based on the principle of correspondence between the world and man” (Bolkhari Ghahi, 2006, 5). As stated earlier, the ultimate goal of the union of opposites in alchemy correspondences is to achieve balance and, consequently, the perfection of everything. This balance in the luster-ware mihrabs has been achieved with the help of reflective symmetry in eslimi patterns, inscriptions and framing of motifs. In Islamic arts, observing symmetry in all aspects of making and decorating is one of the principles; But in luster-ware mihrabs, in addition to the principle of symmetry, we are confronted with

a method of drawing which is consistent with this alchemy thinking that says; everything above exists in below. This principle is well explained through using and repeating smaller versions of the mihrab, and, a smaller mihrab is engraved in the heart of each mihrab which can be related to this principle of alchemy (which is the imitation of the lower world of the higher world).

Results

In previous research, the emphasis on the symbolic language of alchemy has shown its correspondence with the sacred symbolic art to extent that Burkhardt calls alchemy a sacred art. Also, from an aesthetic point of view, the luster-ware mihrab is of great importance among the Islamic holy relics. Therefore, according to previous research, the connection between alchemy and mysticism, the symbolism of the language of alchemy and the importance of the shrine of luster-ware are obvious among the examples of sacred art. On the basis of the issues raised in this study, a new look at the category of alchemy obtained. The points that are the result of this comparative study are summarized in Table 2 and Fig. 6.

although the variety of decorations of luster-ware mihrabs is limited in compare to other works of Islamic art, the influence of alchemy knowledge and mysticism in the structure of these sacred works is not limited and is vivid. This similarity can be seen in the instructions, consumables, symbols used, decorative patterns, contrasts and glitter of colors and represents the ultimate goal of both (alchemy and the construction of the luster-ware mihrab), which is the same as the way, perfection is gained through transformation.

Conclusion

Principles related to alchemy have been declared and used repeatedly by various philosophies during history; since alchemy originated from the oldest religions, namely the wisdom of Hermes, this proves the historical precedence of its symbols and signs. In the discussion of art, in this article, by studying the luster-ware mihrabs, the presence of alchemy in the sacred Islamic art was shown. This similarity in terms of instructions, manufacturing process and materials used is shown as shown in (See Table 2) and it can be said that luster-ware is a

Table 2. A Comparative Study of luster-ware mihrab Construction Techniques with Alchemy. Source: authors.

	Luster-ware mihrab	Alchemy
Consuming materials	The inherent quality of each substance used and its degrees of existence are important in terms of spiritual effects. The most important materials were iron, copper, silver and sulfur, combustible material, vinegar and the most important tools of the furnace or fire.	Materials were placed in different degrees in terms of purity and the goal is to achieve the perfection of matter. The most important materials: gold, silver, copper, iron, tin, lead, zinc, mercury and sulfur; The most important tool: stove or fire.
Instructions	Clay loses its molecular water in contact with high heat and turns into pottery, which is a material with different properties from clay. By applying Luster glaze, the oxides used in the glaze compounds are transformed into thin layers of metal and the tile gets a metallic effect.	The process of alchemy takes place by heating in order to transform the material. Firing is done in seven stages so that after purification from any contamination, chemical marriage takes place and the substance, in combination with its corresponding, becomes new and higher substances.
Effective factors	Material combination ratio, furnace temperature, reduction time, furnace cooling duration.	Material combination ratio, furnace temperature, type and amount of heat in each of the seven stages of alchemy (melting, calcination, sublimation, evaporation, purification, roasting).
Symbol and sign	Metallic shining, symbols of light (domes and lamps) Repetition of smaller mihrabs in the heart of the main mihrab, reflective symmetry in motifs, triangles with two domes and chandeliers, rectangular frames for decorations, rotatory motions of Islamic motifs.	Gold, the principle of reflection, the principle of duality, the trinity of creation, the squaring of elements, the circle, Ouroboros and Caduceus.
Conclusion	In both, the inherent quality of the materials and their spiritual power are important and the transformation is achieved by heat; But the difference is that the process of building the luster-ware mihrab had simpler steps; Because in the sacred art, transcendent materials are used; But in alchemy, the purpose is to turn matter into its perfection. As a result, alchemy is the path that matter takes to become transcendent and sacred art is the place for the presence of this transcendent matter to express holiness.	

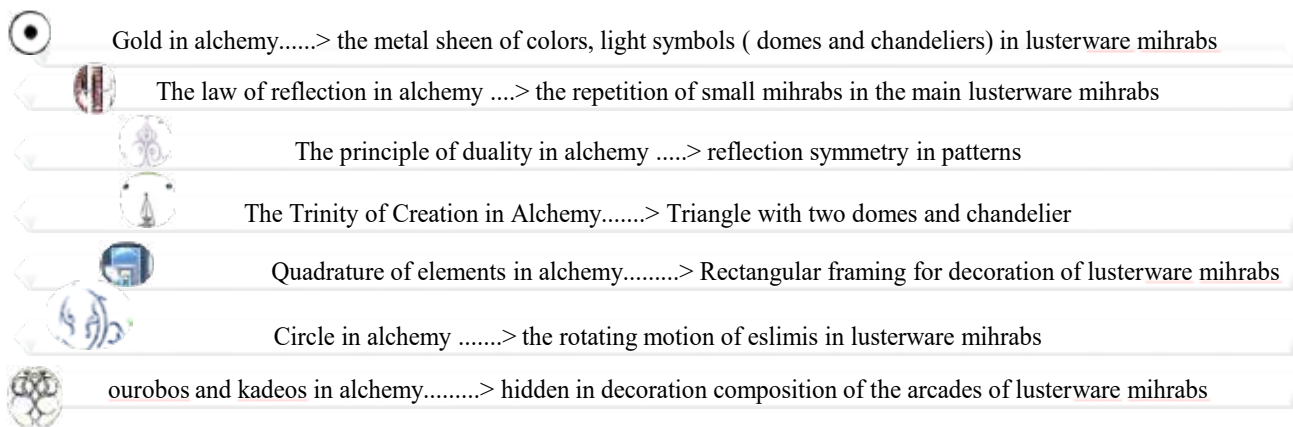


Fig. 6. Correspondence of symbols and signs of alchemy with visual signs of the luster-ware mihrabs Source: authors.

unique chemical technique in Islamic which is able to turn pottery and clay into valuable objects. In addition, in examining the visual structure of luster-ware mihrabs, despite the limitations of motifs and decorations, symbols and signs of alchemy were seen in the visual structure of luster-ware mihrabs in hidden form (See Fig. 6) and signs indicating the effect of alchemy on art observed in the frame of luster-ware mihrab overtly (See Table 1). In general, by examining the relationship between alchemy and the luster-ware mihrabs, in response to the question of what role did alchemy play in the formation of the luster-ware mihrabs? And how are the symbols of alchemy manifested in these works? It must be acknowledged that alchemy and sacred art correspond to each other and complete each other. As observed in the structure of the luster-ware mihrabs, the sacred art with the help of the symbolic expression of alchemy has obtained abstract forms and on the other hand, the mysteries of alchemy with this connection have been progressed during history and has continued to live. The emergence of alchemy in the structure of the luster-ware mihrabs, with its cryptographic expression in the form of hidden and overt symbols, has shown the importance of alchemy in its formation as an effective pillar. At the same time, the purpose of both (sacred art and alchemy), is to help human being, to guide him on the path of perfection and to connect him to the eternal truth. For

this reason, alchemy from a mystical point of view has a high status and value in the analysis of Iranian Islamic art.

Endnote

1. (O humanity! There has come to your conclusive evidence from your Lord. And we have sent down to you a brilliant light((Quran, Nisa', 174).

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