



CERAMIC MIHRABS IN RELIGIOUS BUILDINGS IN BUKHARA DURING 16TH C.

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ABSTRACT

This paper deals with the study of two ceramic mihrabs located in the complex of Kilan Mosque, Baland Mosque. Concerning the general form of those Mihrabs; raw material and decorative methods of their covering, rather than the most important artistic characteristics as well as the analyses of their decorative motifs and the most important foreign influences. The obtained results revealed that quartz is the dominant component of the tiles' core; goethite was the yellow pigment materials used, while the tiles are deeply affected by soluble salts and relative humidity. The decorative richness and the decorative style used in the mihrabs are prevailed in Timurid period and were seen also in the contemporary buildings of Samarkand and Iran.

KEYWORDS: Ceramic mihrabs, Central Asia, Bukhara, Kilan mosque, Baland mosque, Ceramic tiles, Tile mosaic, Decorative motifs

INTRODUCTION

The area of Central Asia is filled with many remained religious buildings such as mosques, schools, khanaqahs, and mausoleums. The mihrab of Kalan mosque and the mihrab of Balnad mosque date back to 16th c. and covered with ceramic tiles, where Shai-banids 1500 – 1599 and after them Ashterkanids 1599 - 1785 used ceramic in covering the inner and outer wall of their buildings by forming various designs that consist of floral ornaments, geometrical shapes and inscriptions, all of them were affected by Timurid period 1371-1504.

This study aims to:

- Trying to know the most important artistic characteristics of the study period, and the general frame of it as well as the features of artistic creation of those ceramic mihrabs, in addition to the decorative designs and the variety in their motifs and their matching with color degrees.

- Classifying the styles of these mihrabs in Bukhara, the most important characteristics-local and foreign.

- Study of the artistic creation of mihrabs makers, the forms of their decorative designs and heir matching with color degrees.

The importance of the study is represented in the fame of old Bukhara, its location as a meeting point of trade roads that made it a center of different influences and a center of makers and artists that had a good reflection on the decorations of the mihrabs of Bukhara.

ARCHAEOLOGY

The research includes a descriptive study of two ceramic mihrabs which hdates back to sixteenth century through them we can recognize the different places of mihrabs inside the buildings, the general shapes, their coverings as well as studying their decorative motifs and decorative style used in them . In addition to an analytical study to recognize the industrial methods and raw materials used in them. At last to recognize the artistic Features, the study of their various decorative motifs as

well as some foreign influences found on those mihrabs.

Raw materials

Transoxinia are distinguished by their richness with excellent types of stones, such as lime stones, sand stones, granite, marble and onyx, so the constructions filled with carving and decorations where the makers were very good at mixing these earths and sands for getting a very beautiful shapes and colors.

Bukhara was characterized during the sixteenth century by using the best types of clay which used for making tiles, that was due to the presence of the ancient land road which carried the raw materials good for making ceramic, imported from china where there are the best types, silica (Summer2004). Thus these tiles were characterized by its stable, lightness delicacy of the clay.

The pottery of central Asia characterized by two types of glaze:

1-alkaline glaze"ishkor" was sieved and ground, then mixed with ground claimed white quartz or pure sand and a little water, and formed into small balls or pellets which were then dried, kiln-fired and ground. This was common in the Ferghana valley.

2-lead "graphite" glaze: was common in Bukhara and Samarqand it was characterized by its cheap materials and the easiness of its use, it needs less effort than the alkaline glaze. It contains a great amount of lead oxide which is more common than alkaline paints due to the easiness of its coloring with most colors which include blue, red, green, bright yellow and orange where we can compensate the symmetry between the blue and green colors by using a mixture of alkaline glaze (Summer 2004).The used colors are characterized by beautiful variety, and quietness, which depended in general on the white and blue with their degrees as well as some other colors such as yellow and green.

Technical methods

The methods varied in covering the two mihrabs included tiles and Mosaic side by side.

Ceramic tiles

They were varied between the rectangular, square, hexagonal and octagonal shapes as well as stellar shape and perpendicular shape.

In addition they were varied in their sizes, the reasons for the easiness of executing tile than mosaic were : its low cost, especially in covering large areas, the easiness of its executing, its less complex than mosaic it doesn't need much effort, and it's easy to draw on it. Ceramic industry usually has a number of stages.

First, monochrome enameled tiles of various colors were prepared – navy blue, turquoise, emerald green, saffron yellow, white and black, with the occasional addition of brown and red – each one requiring a specific firing time in order to achieve its maximum beauty. Then came the cutting of the tiles according to model furnished by the ornament list. For this the cutter used a kind of adze which had to be wielded with great delicacy in order to avoid chipping the enamel. Once cut, the edges were fitted together face down. A layer of mortar was then poured over this precisely adjusted assemblage. Finally, when it had dried it was transferred to the surface it was to decorate and it was fixed in place. (Celevento 2000).

It could be noted that the developed glazed tiles is one of the glories of the Il-khnid period. The Kashan potter, which were pre-eminent during the Seljuk period, survived the destructive Mongol invasions, and produced during the early fourteenth century some remarkable glazed mihrabs and cenotaphs distinguished for their luster, resonance and depth of color. These mihrabs, made up of several tiled panels, turquoise and white, with a luster overglaze. Fine examples include the mihrab from the Imam zadah Yahya at Varamin 1305 (Yeomans 1999).

Tile mosaic

Tile mosaic is made of white ceramic clay painted with colored slips, many of them covered with transparent glaze paint. (Grazhdankina 2006).

Mosaic, in general is a kind of ceramic depends on forming different drawing by using small pieces or lopes of different materials and colors in this case each color should be burnt in its temperature that gives it special brightness, where these pieces gathered side by side to form a decorative theme, then mortar is poured on it from behind to fill gaps among them, then fixed at the place wanted to be decorated (Wilber 1934).

Shapes of Tile mosaic differed as well as its industrial techniques which were used sometimes in the same building that gives it more industrial and decorative richness Mosaic was used a lot on large areas on the buildings of our study.



Figure 1. The mihrab of Kilan mosque

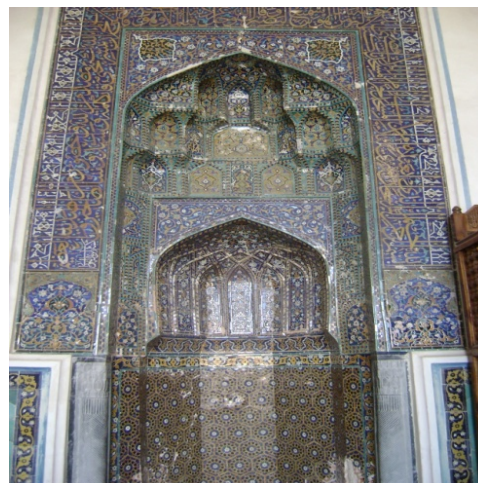


Figure 2 The mihrab of Baland mosque

The decorative designs included, floral decorations represented in Arabesque (*islami*), and in making some artistic paintings, where artists followed an artistic style of flor-

al decorative design in ceramic formation of floral design on the sides of the mihrab of Kilan mosque (Fig. 1), and the mihrab of Baland mosque (Fig. 2)

The formation of Tile mosaic depends on two methods:-

The first method

1- painting is drawn on a strong paper and colored, then it is cut into many pieces then gathered together after that, that method is known in English by jig – saw- puzzle.

2- each piece of paper is taken and re-drawn on individual ceramic tiles.

3- the tile is colored with the same colors existed on paper, then painted with alkaline glassy paint, after that burnt in the oven.

4- these painted pieces left in open air,

5- these pieces gathered in a mould, and then a thick layer of mortar poured on its back to solder the pieces together. Thus we have a complete painting of mosaic tile.

The Second method

It consists of small pieces, cut from large plates different in colors, each color should be burnt in a suitable temperature that gives it special brightness.

- The use of Tile mosaic appeared in a lot of architectural mihrabs, as well as mausoleums in central Asia where it appeared in one example at Abedel-Khaleq Ghadwani mausoleum in Bukhara fifteenth century with the tiles executed by Cuerda seca technique and glazed brick moulds, In Timurid period the same technique continued where it appeared in some mausoleums in shah-i zinda in samarqand for example: Shirin Beg Aqqa mausoleum 1385, Tuman Aqqa mausoleum 1398-1404, these example covered with mosaic made of brick in various colors (Blair 1995).

Gur-i Amir in Samarqand 1404, Ulug Beg madrasa in Samarqand 1417- 20, where mosaic covered large areas of inner and outer walls of the constructions. (Grazhdankina 2006).

Mosaic decorations used floral motifs such as branches, leaves and rosettes inside medallions. (Blair 2007).

In addition, we see examples in Samarqand during Ashtar khanides period 1599-1785, such as the façade of Shir dar madrasa in Samarqand 1619 - 36, and Tela kari madrasa in Samarqand 1647 – 60 (Celevento 2000).

These ceramic mosaics were used in the contemporary buildings in Iran such as Masjid I shaikh Lutfallah in Asfahan 1602- 1619, as well as the walls and freezes which included inscriptions executed by ceramic. In addition to, the main entrance of Masjid I Shah (Masjid I Imam) in Asafhan 1611- 1616, which is covered with mosaic in different colors, the most common color was blue color.

From the previous, it is clear that the art of ceramic mosaic was used in Timurid period in Iran and Central Asia, and the same industrial methods continued in Bukhara during the period of the study.

Here the mosaic was characterized by the variety of its decorative designs such as abstract and realistic floral decorations. and some geometrical shapes, inscriptions, drawings of legendary creatures, in addition, its colors varied among white, blue with its degrees, dark yellow, and green.

MATERIALS AND METHODS

X-ray diffraction (XRD) was performed on powdered samples of the core and glaze materials in addition to the mortar used to adhere the tiles into the walls, using a Philips (PW1840) diffract meter with Ni-filtered Cu-K α radiation. The samples were scanned over the 0-60° 2 θ intervals, at a scanning speed of 1.2° min⁻¹. A quantitative estimate of the abundance of the mineral phases was derived from the XRD data, using the intensity of certain reflections and external standard mixtures of minerals compared to the (JCPDS standards of 1967); the detection limits of the method were ± 1 w/w %.

According to the analyses of the samples derived from the two mihrabs, it has been proved that; *Sample No. 19* (Fig. 3) which is

derived from the deterioration products composed on the surface of the glaze layer, composes basically of 64% Quartz which represents the main glaze material, in addition to 16 % of Calcite which represents the internal core of the glazed tiles, Calcite migrated to the surface of the tiles due to the abrasion of the glazed layer due to the effect of salts and relative humidity, this hypothesis is supported by the high ratio of halite in the sample (20%), the latter is indicator for the effect of drainage and ground water on the studied mihrab.

Sample No. 35 (Fig. 4)

Based on the XRD analysis of sample 35 which represents the glazed layer of the tiles it has been found that the sample composes of 46 % Quartz as a dominant compound, in addition to 34% calcite (the internal core of the tile), the yellow pigment of the glazed layer is goethite (20%) this pigment has been used as an alternative cheap pigment to give the effect of gilding, the pigment is deeply affected by relative humidity and salts as its color became darker.

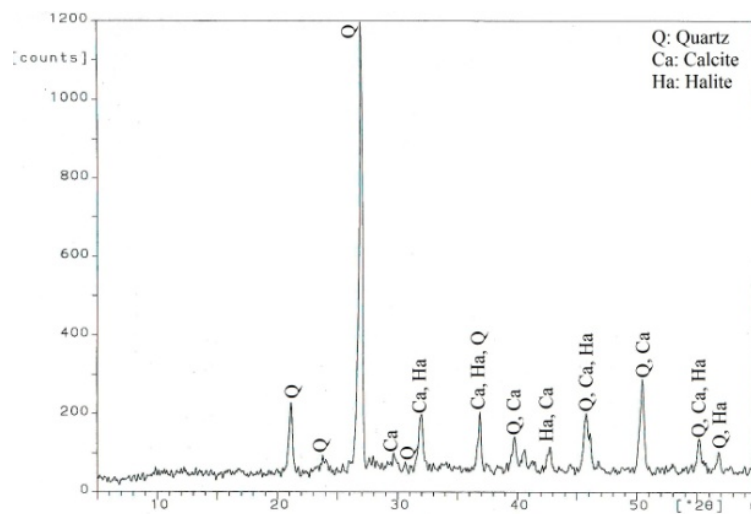


Figure 3. XRD of Sample No. 19

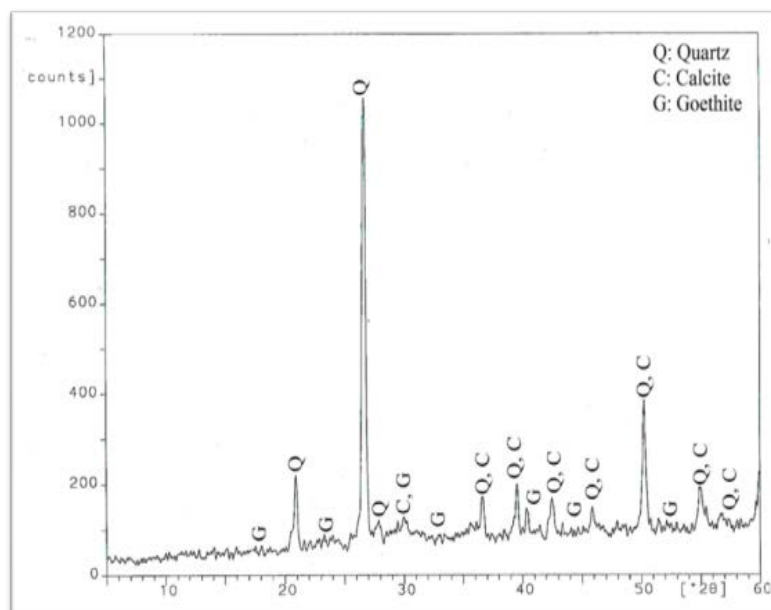


Figure 4. XRD of Sample No. 35

DECORATIVE MOTIFS:

Constructions included two mihrabs which were characterized by decorative richness, these decorations varied between realistic and abstract floral decorations and geometrical shapes executed as ceramic compounds of tiles and ceramic mosaic and the use of varied inscriptions different types.

Floral decorations

Floral decorations played an important role in decorating mihrabs, they came first consist in most cases of realistic and abstract decorations and they appeared in various forms or as separations between inscription lines.

Divided into several shapes: Realistic Floral decorations appeared as a background of floral decorative designs such as complex floral leaves, appeared on the arch spandrels of the mihrab of kilan mosque, and mihrab of Baland mosque, on the other hand floral branches were used in wavy and interlaced form inside geometrical shapes and decorative arches such as in prismatic areas, interlaced arches in the second level of the mihrab of kilan mosque.

These branches were executed inside frame, as individual in a wavy form with leaves and rosettes in realistic style or floral branch carries palmettes, half palmettes and leaves in abstract style and others doubled or two floral branches spiral shape, rising from one of them floral leaves and rosettes in realistic style.

The floral branches were used by the same form and design on the ceramic coverings during the Timurid period, where these branches are considered a continuation of the previous Timurid period (Pougatchenkova 1981).

Rosettes

The rosettes varied in their numbers, sometimes they can be found quadruple and pentagonal or poly – petal as well as rosettes with fan shape and pointed shape, the artist

executed them through the floral branches with flowers in a symmetrical shape, there sizes varied between small ones, or large ones according area.

Trilogy Rosettes

They are considered one of the most important used rosettes in ceramic covering or mihrabs, they were executed through some decorative designs in the form of three circles such as in the mihrab of kilan mosque.

Quadruple rosettes (Fig. 5)

They were executed through the decorative designs, such as in the mihrab of kilan mosque.



Figure 5. Quadruple rosettes

Leaves

They varied through the decorative designs of ceramic coverings on the mihrabs, they were drawn close to nature, they didn't have a fixed shape or color.

The leaves are related directly to the stems and branches, so they were executed in a suitable way of the interlaced stems and branches, its extending. The leaves take different appearances such as simple leaves or complex leaves.

Simple and bud Leaves (Fig 6)

They executed through floral decorations, they were often pointed at the top such as in the spandrels of the mihrab of Baland mosque.

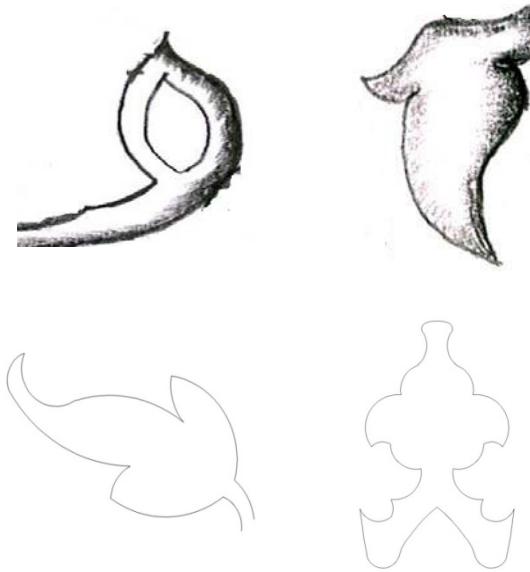


Figure 6. Simple and bud leaves in the spandrels of the mihrab of Baland mosque

Trilogy floral Leaves (Fig 7)

Its decorations were based on half a circle, rising from it lobes of the trilogy leaf in stream lined form, they executed connected to the floral branches, they run through a realistic floral decorations.



Figure 7. Trilogy floral leaves on the mihrab of Baland mosque

ABSTRACTED FLORAL DECORATIONS

They played an important role in the decorations of mihrabs which consisted of floral scrolls with abstract floral leaves, and palmettes' units forming repeated decorative designs on similar distances, covering all areas most of them arabesque which contains:

Floral scrolls

consist of spiral floral branches and wavy sometimes rising from them simple half palmettes, multi-lobed extending to give decorative areas large and small on the mihrabs these scrolls are the first base in executing this decoration, the artist finished its ends with palmettes extending on the shape of bows or spirals followed or Interlaced with accurate wavy decoration expresses or shows its floral cells.

Decorative methods and themes varied as follows

-twisted in spiral shape decorated with floral leaves' ends with half palmettes and it appears with the realistic floral decorations as in the spandrels of the arch of kilan mosque.

-floral scrolls executed in Hatai style through them half palmettes, connected to each other by tri-lobed floral leaves.

The scrolls are decorated with drawings of flowers, roses in realistic style as in the mihrab of Baland mosque.

Floral scrolls were used by the same shape in ceramic coverings on buildings since Timurid period for example: spandrels of the arch of the entrance of shirin aqa mausoleum at Shah-i Zinda in Samarqand 1385, the ceramic coverings at the tops of the minarets of mosque, the closed niches on the two sides of the entrance of Bebi Khanum mosque 1398-1404. (Pugachenkova 1981).

The two spandrels of the arch of the main entrance and the door opening of Ulug Beg madrasa in Bukhara 1417.

Flowers

They consist of five main parts as follows, Large branches, small branches, leaves, buds and flowers, according to the variety of flowers motifs we can choose one flower to form a complete decorative theme to achieve the purpose either in natural way or abstract one, the shapes of flowers varied on ceramic coverings- the subject of the study- as follows:

Lotus flower

The Chinese lotus flowers are considered one of the most important features of abstract floral decorations they were drawn through floral branches as a main motif among them secondary motifs consist of leaves rosettes, which compose the general design, the shapes of the flower varied, some of them with almond shape in the middle, rising from it convex leaves, and some others consist of a circle in the middle, rising from it circular leaves, the flower is characterized by its abundance leaves it begins from the lower part with small leaves increased when we go up, sometimes they are drawn in white only on a dark or a light blue, and some of them varied in colors between white and blue with its degrees and yellow. The most important example the mihrab of Kilan mosque, mihrab of Baland mosque

This flower appeared a lot on the ceramic coverings of Timurid buildings and it took the same previous shapes as in Shah-i Zinda complex at Samarqand 1385, Bebi Khunum mosque in Samarqand 1398-1404, Ulug Beg madrasa in Samarqand 1417.

The artists used it in the applied arts as wood works it was used on the spandrels of the arch which decorated the central panel of the door shutters of shams el-din kallal mausoleum in shahr i sabez 1373, and on the spandrels of the arch which decorated the central panel of the shutters of the door of the copper room in Ahmed yasavi complex in Turkestan.(Zakhidov 1996).

Beside the lotus flower, the artists drew an abstract flower on ceramic coverings; its leaves took the shape of a conex with loped ends in brown color such asthose in the second level of Kilan mosque mihrab, and Baland mosque mihrab.

Palmettes (Fig 8)

Floral scrolls ended with palmettes and its halves varied in sizes according to the available area as on the mihrabs of our study, they were executed in different shapes as follows:-

Executed in Hatai style inside them realistic floral decorations consist of flowers and rosettes as in the mihrab of Baland mosque.



Figure 8. Palmettes shape on ceramic Mihrabs

Harty and almond unit

Through the floral scrolls there are heart and almond shapes executed as a result of the scrolls of floral brunches and half palmettes occupied the inner areas of some decorative formations and crowned them and others based on it, they sometimes used in the connection of some floral scrolls, they are simple and varied in their sizes according to the area.

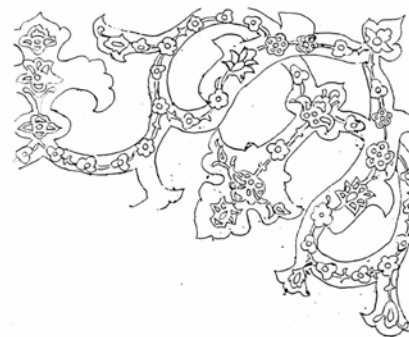


Figure 9. Realistic floral decorations in the mihrab of Baland mosque

Concerning the almond shapes appeared simple and executed as a result of the meeting of floral branches as in the mihrab of Kilan mosque.

There are a lot of hearty examples executed in abstract floral decorations on ceramic coverings since Timurid buildings for example the ceramic compounds on the stalactites in the entrance of the dome of Gur-i Amir mausolum in Samarqand 1400 - 1404,

ceramic coverings of the top of the dome of Gur-i Amir and on the engaged columns on the sides of the main entrance of Ulug Beg madrasa in Bukhara 1417. (Pugachenko-va1981).

They are drawn through floral scrolls and executed inside geometrical shapes as a meeting point connecting the floral branches or a secondary unit and crowing some decorative compounds and sometimes executed in Hatai style as in the spandrels of the mihrab of Baland mosque (Fig 9). They were in simple and complex shapes.

Simple shapes

Trilogy leaf, the central lobe bounds up and the two other lobes are straight they were often crowned in some designs such as medallions as in the mihrab of Klian mosque.

Trilogy floral leaf pointed at its top in alternative form used as a decoration resembles the separation frame between the upper and lower levels of the mihrab of Kilan mosque.

Trilogy leaves were a common element in ceramic coverings either on buildings or cofins in central Asia where they appeared side by side with other floral elements in the buildings of Timurid period, for example the façade of the dome of Tughlu Teken in Shah-i zinda in Samarqand 1375- 1376. The main entrance of Tuman Aqa mausoleum at Samarqand 1405 (Manakova 1974).

These leaves appeared on woodworks in central Asia either individually or in a group of leaves through a decorative compound for example a wooden barrier of the mausoleum of Qatham Ibn 'Abbas, and the shutters in the door of the copper room in the complex of Ahmed yassavi.

Complex shapes

Trilogy leaves were executed in a complex form so they appeared in different ways as:

Trilogy leaf winged – loped executed in Hatai style in the mihrab of Baland mosque. The trilogy leaves were drawn in Seljuk pe-

riod in a cupped shape, and continued during the Ilkhanid period, sometimes the main motif was the abstract floral scrolls, the trilogy leaves were drawn during the Timurid period in various ways :

Multi-loped leaves

They varied in shapes and sizes, they were executed in different positions, as a main decorative unit through decorative designs or small individual units in the middle of the design .they also appeared in complex forms, decorated the arches of entrances, niches, and windows as follows:

Multi – loped floral leaves, decorated from upper and lower parts with trilogy floral leaf as on the spandrels of mihrab of kilan mosque.

Vases

Vases forms varied on ceramic coverings in the buildings of our study, they were characterized by simplicity and stream lined,

They were composed of three main parts: base, body and crater “nozzle”, coming out of them floral scrolls, rising from them leaves, rosettes and flowers in symmetrical form.

Among the decorations of mihrabs, an abstract decoration consists of a vase form with almond body from half palmettes, its top take, the shape of trilogy leaf based on a base of half palmettes, the body of the vase filled with half palmettes and lotus flower, from the crater of the vase coming out floral branches, rising from them palmettes and its halves in white, light and dark blue on a ground of realistic floral decorations consist of floral branches through them we find rosettes, and lotus flowers in light blue on a yellow ground.

The use of vases was a continuation of some vases in decorative designs inside some Timurid buildings, the most important example of it: the ceramic compound on the sides of the main entrance of Shirin Bek Aqqa mausoleum in Samarqand 1335, and on the

sides of the central niche at the main entrance of Shirdar madrasa in Samarqand 1619. (Pugachenkova 1981). It executed by ceramic mosaic including the signature of the potter "this is made by Mohamed Okaz Al- Samarqand. (De George, 2002).

GEOMETRICAL SHAPES

Geometrical shapes played an important role in the decorations of two mihrabs.

They were used as frames for another decoration and some of them as geometrical designs as in the second level of the mihrab of Baland mosque. Among geometrical shapes which decorated the mihrabs, the following:-

A-Hexagonal shapes

They have six sides, similar sides or rectangle, and a hexagonal with ends, they were used in the covering of the first level of mihrabs for example a hexagonal shape with similar sides at the first level of the mihrab of kilan mosque, another hexagonal shape with similar sides resembles honey cell at the first level of the mihrab of Baland mosque

The hexagonal shapes with similar sides appeared on applied arts such as wood works in Timurid period in the wide frames which surrounded the rectangular and square panels of the shutter of wooden doors, for example on the wide frame of shutters of the door of the mausoleum vault at the complex of Ahmed yassivi in Turkistan 1349.

It's noticed that, those hexagonal shapes were not only used on the wide frames surrounded the panels of the shutters of wooden doors but also used as frames for a lot of books covers which dates back sixteenth century, in addition, these shapes were used at the opening pages for example the opening page of Khamsa Nizami manuscript which dated to the end of sixteenth century. (Suleimanova 1985).

THE COMPLEX GEOMETRICAL SHAPES

They consist of star shapes with its types and polygons and its units.

Star shapes

They are considered of the decorative motifs which were common in geometrical designs, some of them were executed by ceramic mosaic and decorated with floral decorated, and in addition they were used for covering large areas in buildings.

They varied in numbers, as we find uncompleted star shapes "parts of stars" and small stars with three heads used as frames surrounded decorative designs and the inscription at the mihrab of Kilan mosque

Decoration deprived from Architectural elements

It means the elements which used by the artist as an ornament for decorating the mihrabs of our study which represented in arches with their different types.

Arches

They are one of the most important architectural elements which appeared artists of Central Asia as a characterized element, and they were used as decorative arches not architectural surrounded floral decorative designs appeared on the ceramic compounds on the sides of mihrabs.

Multi- loped arch

They were composed of a series of small arches or bows which reached seventh arches or more, they surrounded floral decorative designs consisted of branches, leaves, and rosettes, some of them were executed on the sides of mihrabs such as the mihrab of kilan mosque, the mihrab of Baland mosque.

These types of arches previously appeared on some buildings in central Asia at the beginning of Timurid period for example entrance of Amir zada mausoleum in Shah-i zinda at Samarqand 1386, and a covering of Cuerda seca tiles at the ground of Usto Ali Nasfi mausoleum in Shah-i zindeh 1385, where it the top of the arch decorated with trilogy floral leaf.

In addition it appeared on the sides of the main entrance of Shirdar madrasa in Sarmarqand 1619-1636.

INSCRIPTIONS

Inscriptions are considered one of the important elements of the Islamic heritage, they varied in shapes so it's considered one of the most characterized features of Islamic arts in all arts, buildings or applied arts, through the study of inscriptions executed on the buildings of our study we find different types as follows:

Kufic script

Kufic executed through the heads of Thuluth inscriptions in simple, floral, foliated and twisted on ceramic tiles most of them were religious inscriptions thus they were suitable for using them on buildings, they included repeated blessings such as "Allah in the great", their color varied among white, green, blue and brown on a dark blue ground.

The most important examples, around the mihrab of kilan mosque, the inscription band around the mihrab of Baland mosque

Thuluth script (Fig. 10)

Mihrabs are full of Thuluth inscriptions which were considered the most common type as the artists could match the letters with decorative areas.

This inscription didn't appear individually on mihrabs but it appeared with another inscriptions such as kufic and its types, it's often we find through the inscription in Thuluth, another inscription different in shape and content from Thuluth, it was often executed in Kufic.



Figure 10 : The inscription band in the mihrab of Kalan mosque

Thuluth on mihrabs was executed in various levels, the top of its development at the period of our study, we can call it the complex thuluth we find it appeared on some

mihrabs in two levels and the third is Kufic, and others in three levels and the fourth is kufic for example the mihrab of kilan mosque.

The hand writer used color degrees in executing these inscriptions; we find brown inscription executed on a dark blue ground with touches of light blue.

Thuluth used in executing a lot of inscriptions which have different contents either religious or documentary, in this concern it differs from kufic which was used only for executing inscriptions with religious content on buildings.

The content of the Inscriptions

Most contents included religious inscriptions such as verses from Quran, some prophetic Hadith, and blessing sentences. Quran verses were executed on buildings as they related to the content of their jobs where the decorator executed verses show that mosques are houses of Allah on earth and preaches for populating them and praying in them, in addition, some verses show the mercies of Allah on man, the most used verses from surat el Israa . In addition to the Quranic verses we find some religious sentences included "Allah is the great"

In general the artists used tiles, ceramic mosaic in executing his inscriptions on mihrabs, concerning tiles; he used two different colors mostly light colors such as white, green and yellow while the ground in dark color which was often blue thus inscriptions became clearer to achieve its decorative purpose as well as its content.

THE INFLUENCES

Cultural relations varied between Bukhara and some neighboring countries either its direct neighborhood as Iran, Russia or indirect such as Turkey, European countries and china.

The location of Bukhara- as land or marine roads – had its effects on the appearance of some different influences. Trade routes are considered one of the most important bridges

for cultural communications and transferring influences among countries, the Arab silk road one of the most famous trade roads in medieval ages which connected countries of central Asia and its east to western countries, that was the road which the Timurids gave it great interest and was a cause of connecting Bukhara and Samarqand with Iran and central Asia.

Among the foreign influences which appeared on the mihrabs of our study:

Chinese influence

The closeness of the geographical location between Bukhara and China contributed in consolidation of relations between them rather than trade relations which were strong between the two countries due to silk road and the road of caravans coming from China through Bukhara to the countries of Russia and Europe thus the relations between them were continuous through history, one of the important factors which helped in cultural communications between them the immigration of some Iranian workers to Bukhara, they carried with them Chinese artistic styles of decorations and colors which came with the Safavids in ceramic industry, these relations continued through history and left clear influences on arts generally and on ceramic drawings in Bukhara especially, so we find the influence of China on the drawings of Bukhara ceramic.

These influences increased during the Timurid period and Shaibanid period 1500-1599, where we find a lot of Chinese influences on ceramic products in central Asia (Summer 2004) that isn't strange because Bukhara was famous as a meeting point of Chinese products and western Asia.

Chinese influences are clear on mihrabs of our study in decorative style through:

-the floral decorations represented in lotus flower which executed in different shapes as mentioned before, which were founded nearly on all ceramic coverings in all buildings of the period of the study, they were executed mostly in blue and white colors as we find in

some positions of the mihrab of Kilan mosque, mihrab of Baland mosque.

Iranian influence

Trade roads weren't the only bridge of transferring influences but wars also had a role in transferring them, thus the relation between Bukhara and Iran was very strong despite the disturbances during that times.

This is clear since sixteenth century when Shaibani Khan the leader of Uzbek in 1507 could conquer Herat but during three years only Shah Ismail could restore it again, in spite of this a lot of Iranian artists immigrated to Bukhara but soon Herat was conquered again by Uzbek in 1535 and they could plunder it. (McChesney 1997).

This invasion was a strong reason for the immigration of a lot of artists to Bukhara thus a lot of Iranian artistic influences appeared on the art and architecture in the buildings of Bukhara. That is clear during the rule of Shibanids in Bukhara they built a number of ceramic factories, whose products came into a closer relation to the industrial methods and the Iranian decorative styles.

Some Iranian influences appeared on ceramic coverings as follows:

Arabesque (islami)

The use of floral decoration distributed in geometrical way from delicate floral branches in wavy shape and interlaced, rising from them delicate floral leaves, small flowers executed in accurate style as well as the decorative style represented in gathering between natural drawings and abstract style.

-The Iranian spirit appears clearly in kufic inscriptions styles and Thuluth where hand writers gathered between floral decorations and the inscriptions so the floral decorations came as a background of the inscriptions that was the style prevailed in Iran during Timurid period.

Thuluth inscription was used on buildings and arts, in addition, they used types of kufic such as floral and foliated, and square kufic

which was suitable for coverings methods in Safavid buildings by using mosaic and bricks which appeared also in ceramic coverings of the mihrab of our study.

- Iranian influences were clear in executing of their drawings sometimes using quiet colors which were influenced by Chinese arts.

All these influences were a continuation of Iranian influences in Timurid period, because Timurid period was considered the artistic and architectural renaissance in central Asia which extended to the period of shibanid rule and after them Ashtarkhanids I, they are considered the forensic heirs of Timurids.

Turkish influence

-Among Turkish influences which appeared on ceramic coverings of these mihrabs, the speary leaf known in Turkish art with Saz leaf, where it didn't carry inside it any of other floral elements as found in Turkish art. (Welch1972).

-Hatai decoration is considered one of Turkish influences which found on ceramic coverings that executed by the same shape of the fifteenth century and represented in a Chinese style through it we find perches ex-

tending with small rosettes as in the mihrab of Baland mosque.

CONCLUSION

Based on the results of XRD analyses; it has been concluded that the raw material of the glazed tile in both of the two mihrabs is quartz (sand) mixed with calcite (lime), while the yellow glazing pigment is goethite. The two mihrabs; are exposed to the effect of soluble salts and ground water; as the analyzed samples contain halite (sodium chloride) in their composition.

The decorative richness and the decorative style used in decorating mihrabs which prevailed in Timurid period, it can be also concluded that these decorations were used widely in the contemporary buildings in Samarkand, Bukhara and Iran. The geometrical shaes came in the second place after floral decorations, and which were characterized by the variety in simple and complex geometrical shapes. Finally some foreign influences appeared on the two mihrab of our study as a result of cultural relations between Bukhara and some neighboring countries either direct neighbors or indirect neighbors is clear in some Chinese, Iranian and Turkish influences.

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