

**m18.p01****Powder X-ray Microdiffraction in Research of Wall Painting Damage by Salts**E. Kotulanova, P. Bezdicka, T. Grygar,  
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Salts are one of the most dangerous degradation agents of artworks, especially those with porous nature, such as stone sculptures and architecture, wall paintings etc. Salt damage of wall paintings is not only mechanical, i.e. resulting from the increase of crystallization pressure, but also chemical and mineralogical alteration is taking place on the painted surface. For optimum choice of appropriate restoration procedure it is crucial to know what salt is present and what its source is. Optical microscopy and SEM/EDX are usually used for analysis of fragments of wall paintings. Powder X-ray microdiffraction (micro-pXRD) enables direct phase analysis from spot with a diameter of 0.1 mm. Analysis of colour layers by micro-pXRD can reveal a presence of secondary crystalline phases which can be overlooked by elemental analysis. Measurements of fragments of wall paintings at Piaristic Dormitory in Litomysl, Czech Republic, and Pre-Romanesque frescoes at the Kostolany church, Slovakia, have been provided to describe the salt damage processes. For example, brown mineral platnerite ( $\text{PbO}_2$ ) found in colour layers beside minor cerussite ( $\text{PbCO}_3$ ) and hydrocerussite ( $\text{Pb}_3(\text{CO}_2)_2(\text{OH})_2$ ), results from a chemical reaction of white lead pigment with fungicide agents. This finding helps to recognize the previous cleaning methods applied to frescoes and also to reconstruct the original colour scheme of the painting.

**m18.p02****Moroccan geometric patterns**

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Symmetry is the prominent feature in the arabo-Islamic decorative art (Arabesque) which can be found in its refined and developed form in Morocco and Andalusia. The decorated framework space or basic pattern is constituted of central area called Naâoura (rosette or star), a peripheric area or  $\lambda$ ach at the limit of the framework, and an interface area Hizam (belt) between them. Rosette, with 3-fold to over 96-fold symmetry, is the most eye-attracting element. It often hides the imperfections in the other areas. However the accurate construction of belt and periphery remains essential for harmony and artistic value of the pattern. The perfect adequacy between the three areas requires precise rules of construction.

We present in this work two methods of construction used in the realization of Moroccan geometric patterns. These methods based on the concept of symmetry can be adapted to any material shape (plaster, wood, metal, marble, ...). They consist in tracing a grid with precise criteria of measurement called Hasba. The grid used most commonly is the square grid, and the rectangular one.

The first method adapted to the construction of the finer mosaics or Foussaïfissa adopts a unit of measure called Zqaq (alley) (figure 1). It generally leads to a multiple of 8-fold symmetry. This method introduces a misfit between central area and periphery. To obtain the compatibility between the rosette and the border of the framework craftsmen have to transcend the rule. They break the symmetry of the pattern in the interface area. The second method uses a unit of measure which represents the quarter of Zqaq called Laqtib (stick). The pattern obtained satisfies perfectly the rules of symmetry as well as the artistic standards imposed by the maâlems (craftsman masters).

