

X-RAY DIFFRACTOMETER

Total Cost: € 210.000,00

The X-Ray diffractometer is an indispensable tool to determine the mineralogical composition of a sample taken from a work of art.

With this instrument, it is possible to identify the inorganic pigments used in the creation of a work of art. Presently the GRS does not have such equipment and many times the exact definition of the mineral pigments as well as the composition of the mortar used during the making of the frescoes is very difficult to determine. Some types of degradation that we observe on the frescoes are due to the minerals present in the pozzolana used to make mortar. A study of the mortar could help to identify the quarries where the pozzolana came from. This would be applicable for such works as the cycles decorating the Raphael Rooms presently under restoration.

Another very interesting study that could be carried out with this instrument is an examination of the mineral pigments present in the rich and complex series of paintings located in the Borgia apartments currently under restoration.

The X-Ray diffractometer will also contribute to the study of natural degradation of pigments. The particular techniques used by the artists, together with restorations completed in past centuries, has caused the deterioration of some mineral pigments such as those used for blue and copper-based green. With the X-Ray diffraction, it would be possible to identify the current crystal structure and its changes, and eventually define the causes of degradation. This study is very important for the restoration and proper conservation of our works of art.

Analysis by X-Ray diffraction is crucial for the study of corrosion products present in metallic pieces such as the gilded bronze peacocks in the Braccio Nuovo. Crystals which naturally take shape during the centuries on the surface lead to serious damages. They are known more casually as "cancer of the bronze." These crystals can only be identified with an X-Ray diffractometer .

The Bruker company completed a D8 Advance diffractometer which would be appropriate for these types of searches. The ability to operate with great sensitivity as well as the numerous accessories which can be included in its kit make this instrument the most appropriate to a research lab that works to preserve a cultural and artistic heritage such as that of the Vatican Museums.

