The interaction between light and matter produces different effects that can be used to determine the structure and composition of the material. Two analytical techniques used in this project are X-Ray Diffraction and X-Ray Fluorescence, which take place with high-energy radiation.

A synchrotron is one type of light source that provides a wide range of energies, X-Ray included, and creates a beam with very good properties.

The periodic lattice of crystals determine a position for peaks of the diffraction spectrum. For example, an orthorhombic crystalline structure with axial lengths $a$, $b$ and $c$, the angle $2\theta$ between transmitted and reflected beams fulfils equation:

$$\sin^2 \theta = \frac{\lambda^2}{4} \left( \frac{h^2}{a^2} + \frac{k^2}{b^2} + \frac{l^2}{c^2} \right)$$

where $h$, $k$ and $l$ are the Miller index of a particular crystallographic plane.