MS13-P03 | STRUCTURE AND MICROSTRUCTURE STUDY OF CHARONIA LAMPAS LAMPAS SHELL

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Molluscs' shells are biogenic composite materials built by the mollusc following biomineralisation process. These biocomposite materials are dense and present acellular arrangement tissues which contain at least 95% of minerals and 5% of proteins and traces of polysaccharides. It is recognised that the most part of the organic phase is located between the crystallites (inter-crystalline). However, some organic molecules (intra-crystalline) are also intercalated within the crystalline lattice. This particular combination of organic matter and inorganic material gives to the mollusc shells their remarkable mechanical properties, which render them 10^2 to 10^3 tougher than pure geological minerals. This biomaterial is obtained with a minimum consumption of energy and a precise control of the polymorphism and crystal morphology at the nanometric-scale by the use of various macromolecules secreted by the organism according to its genetic programming.

In the present work, scanning electron microscopy observations are performed on the shell (broken in nitrogen liquid) of Charonia Lampas Lampas mollusc in order to explore the different orientations of the crystal through its thickness. On the other hand, the phase identification of the shell has been determined by X-ray diffraction and FT-IR analysis.