GEOCHEMISTRY AND XRD TO DIFFERENTIATE OOLITIC IRONSTONE GEOLOGICAL LEVELS FROM GERMANY, BELGIUM AND FRANCE AND APPLICATION TO THE ARCHAEOLOGICAL ARTEFACTS

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Particle Induced X-ray Emission (PIXE) and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) have largely demonstrated their capability to analyse trace elements for determining the origin of archaeological materials. Trace elements can in fact be used as fingerprint of the geological origin and thus contribute to provenance investigations. This point is an important question for prehistoric studies, as it provides information on mobility, exchanges and interaction between groups of population. We present experimental PIXE configurations which allow to investigate prehistoric oolithic haematite, at the ppm level without any preparation or sampling. We compare the data obtained with two devices, namely AGLAE (Accélérateur Grand Louvre d'Analyse Elémentaire) in Paris and the cyclotron in the Centre Européen d'archéométrie in Liège and we determined the uncertainties of measures. The geological samples were compared in order to estimate de geochemical variability in stratigraphy and in width of oolithic haematite from the Ordovician in Caen region (France) and from the Devonian in Hesbaye (Belgium). These data were also compared to oolithic haematite used during Mesolithic and LBK (Early Neolithic) in both the regions.

Furthermore we looked for mineralogical fingerprints by X-Ray Diffraction on disoriented powders. The mineralogical composition is ubiquitous and no discrimination between the stratigraphical layers was possible.