



## **Early Pb-Zn mining and transport revealed by elemental and lead isotopes geochemistry nearby a Late Roman to Merovingian cobbled road (Belgium). A direct application of geochemistry to archaeology.**

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A recent archaeological excavation in a Hautes Fagnes peat bog allowed to exhibit an ancient cobbled road buried in the peat. Despite numerous studies concerning this road, its age and purpose are still discussed. Elemental geochemistry and lead isotopes analysis were achieved on two peat columns taken on each side of the road. Six samples have been radiocarbon-dated. Two pollen profiles and slides made from impregnated peat complete the study. Depth profiles of element concentrations display parallel zinc and lead enrichment peaks. Silicium profile displays sharp increase related to small quartzite fragments and clay dropped in the peat during the construction and use of the road. Lead isotopic ratios of peat with high lead concentrations are similar to lead isotopic ratios of Verviers synclinerium Pb-Zn ores. These results consist in the first indirect evidence that those Pb-Zn ores were mined during Late Roman to Merovingian times. These metal pollutions are local in origin as high metal concentration were never found elsewhere in the area. The Pb and Zn environmental contamination are evidenced at the direct edges of the road, suggesting that the later could have been used for the transport of Pb-Zn ores.