ISOTOPE ANALYSES OF GALENA FROM PREHISTORIC ARCHAEOLOGICAL SITES IN EASTERN UNITED STATES

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Introduction

The mineral, galena, consisting of lead sulfide (PbS) played a very important role in the early Native American culture of eastern North America and has been reported from more than two hundred prehistoric archaeological sites in eastern North America. These burial and habitation sites range in age from the Middle Archaic to Mississippian (8000 B.C. - A.D. 1500). The appearance of galena at the prehistoric sites has identified galena to be an exchangeable commodity in the hand-to-hand trade network between the native cultures of that age. This interregional exchange system resulted the galena to reach long distances and quite far from its source deposits. Farquhar and Fletcher (1980, 1984) were the first to have used lead isotope ratios as a means of determining the provenance of galenas found in North-Eastern North American archaeological sites. In this study, galena artifacts from five locations in Florida, four in Illinois, two in Alabama, two in Louisiana and two in Missouri were analyzed for lead isotopes for provenance determination. The potential galena sources are the: Missouri-Kansas-Oklahoma (Tri-State), Upper Mississippi Valley (UMV) and the Southeast Central Missouri (SEM-CM) deposits.

Experimental

Lead isotope measurements were made by FINNIGAN MAT 262 magnetic sector, thermal ionization multicollector mass spectrometer having a 23 cm radius, 90° magnetic sector mass analyzer located within the Geochemistry Facility of the NHMFL. Mass fractionation corrections to the measured isotopic ratios were based on replicate analysis of lead isotopic standard NBS 981.

Results and Discussion

Mineral Deposits

UMV: Upper Mississippi Valley

TS: Tri-State

CM: Central Missouri

VT: Viburnum Trend

OLB: Old Lead Belt

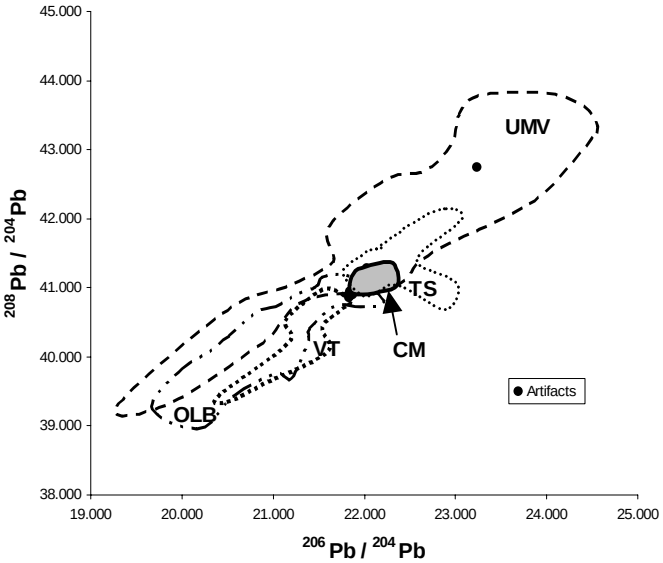

Figure 1. Lead isotope ratio data for galena artifacts compared with similar data for eastern North American mineral deposits.

Conclusions

Lead isotope ratio measurements of galena artifacts from 14 prehistoric archaeological sites indicate a close similarity to the isotopic ratios of galena deposits in Central Missouri. One artifact from Illinois shows a close similarity with the Upper Mississippi Valley deposit.

References

[1] Farquhar, R.M. and Fletcher, I.R., *Science*, **207**, 640-643 (1980)
[2] Farquhar, R.M. and Fletcher, I.R., *American Antiquity*, **49**, 774-785 (1984)