Geophysical Research Abstracts
Vol. 14, EGU2012-6806, 2012
EGU General Assembly 2012

Preliminary Geochemical and Rock Magnetic Study of a Stalagmite From Quintana Roo, Northeastern Yucatan Peninsula

J. Urrutia-Fucugauchi (1), L. Perez-Cruz (1), X. Zhao (2), M. Rebolledo-Vieyra (3), and A. Rodriguez (1)

(1) Universidad Nacional Autonoma de Mexico, Instituto de Geofisica, Mexico, Mexico (juf@geofisica.unam.mx), (2) Earth Planetary Sciences, University of California at Santa Cruz, Santa Cruz, California, USA, (3) Centro de Investigacion Cientifica de Yucatan CICY, Merida, Yucatan, Mexico

We present the preliminary results of geochemical, stable isotopes and rock magnetic studies of a stalagmite from a cave in eastern Quintana Roo, northern Yucatan peninsula. In the past years, there has been increased interest in understanding the paleoclimatic and paleoenvironmental evolution of the Yucatan peninsula and northern Central America, investigating the relationships between climate variations and the development of the Maya civilization. In particular, the variations in regional precipitation and occurrence of several drought periods, which might have been related to the collapse of the Classic Maya period. Stable isotope data on speleothems from different sites in Yucatan and Central America have provided evidence on changes in precipitation, which have affected the Maya region. The stalagmite is $\sim$47 cm long and about 4-5 cm wide at its base. It was collected from the Hilario′s Well cave in Tulum, Quintana Roo. Magnetic susceptibility and geochemical analyses have been completed as part of the initial characterization of the stalagmite, with measurements taken every centimeter. Geochemical analyses have been carried out for x-ray fluorescence, with a Niton XRF analyzer. Magnetic susceptibility was determined with a Bartington MS2 instrument using the high resolution surface probe. Additional rock magnetic analyses include magnetic hysteresis loops and isothermal remanent magnetization (IRM) acquisition, and saturation IRM demagnetization, which have been measured with a MicroMag instrument. Hysteresis loops are diamagnetic, with small varying low-coercivity ferromagnetic components. The elemental compositions of major oxides and trace elements vary with depth. Calcium is the major element and displays a pattern of small amplitude fluctuations with a trend to lower values at the bottom, which are also shown in other elements such as barium. Silica and elements such as titanium and strontium are positively correlated and show an apparent cyclic pattern, with a trend to higher values towards the bottom.