

Abstract

Pottery sherds collected from five sites in lowland Guatemala (Ixlu, Flores, Nixtun Chi'ich, Zacpeten and Tayasal) were investigated using powder X-ray fluorescence (p-XRF), Fourier transform-infrared spectrometry (FT-IR), x-ray diffraction (XRD) and scanning electron microscopy / energy dispersive x-ray analysis (SEM / EDX). P-XRF revealed presence of macro-elements (Ca, K, Al, P, Si, Cl, S, Mg) and microelements (Mn, Nd, Pr, Ba, Zn). FTIR revealed aliphatic n(C-H), carbonyl n(C=O), hydroxyl n(O-H) functional groups. These functional groups give insight into the structure of lipids present in the matrix of the sherds. XRD revealed the presence of calcite, magnesium calcite, quartz and pyrolusite crystalline phases. The EDX data shows the presence of Ca, Al, Si, Fe, Mg, O, and C. The spectroscopic analyses revealed similarities in the elemental composition in the pottery sherds. These findings suggests that the Maya potters used similar materials and firing techniques when making pottery.