

■ Study of Two Papyrus Fragments with Fourier Transform Infrared Microspectroscopy

Joseph M. Azzarelli

Department of Chemistry, Massachusetts Institute of Technology

John B. Goods

Department of Chemistry, Massachusetts Institute of Technology

Timothy M. Swager

Department of Chemistry, Massachusetts Institute of Technology

Executive Summary

Date of Study: November 5, 2013

We have performed FT-IR microspectroscopic analysis on both sides of the *Gospel of Jesus's Wife (GJW)* and the Gospel of John (John) papyrus fragments. Professor Karen L. King of Harvard University provided the papyrus fragments on Tuesday, November 5, 2013.

GJW

The fragment is predominantly composed of oxidized cellulosic material, which is consistent with old papyrus.

The fragment is largely homogenous in chemical composition. We found one anomalous feature that we were unable to identify. We did not observe any major spectral differences between “bare” papyrus and papyrus coated with ink. We did not observe any major spectral differences between the recto and verso sides of the papyrus fragment.

The degree of oxidation is similar to that of the John fragment; however, the *GJW* fragment appears to be slightly less oxidized overall than the John fragment. Oxidation of the fragments is dependent on both their storage conditions and their ages, among other factors.

John

The fragment is predominantly composed of oxidized cellulosic material, which is consistent with old papyrus. Our analysis indicates that the extent of oxidation is slightly greater than the *GJW* fragment.

Like the *GJW* fragment, the John fragment is mostly homogeneous in chemical composition with no significant differences either between bare papyrus and papyrus covered in ink) or between the recto and verso sides.

The John fragment shares a majority of characteristic spectral features with the *GJW* fragments.