

ERRATUM

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Erratum to: A study of the deterioration of aged parchment marked with laboratory iron gall inks using FTIR-ATR spectroscopy and micro hot table

Stamatis C. Boyatzis*, Georgia Velivasaki and Ekaterini Malea

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After publication of the original article [1], the authors found an error with Table 1, the types of vibrations for sulphates were input incorrectly; i.e. $\nu_3 \text{SO}_4^{2-}$ should be $\nu_I \text{SO}_4^{2-}$ and $\nu_I \text{SO}_4^{2-}$ should be $\nu_3 \text{SO}_4^{2-}$. Please see the correct table in this erratum (Table 1).

*Correspondence: sboyatzis@teiath.gr

Department of Conservation of Antiquities & Works of Art, Technological Educational Institution of Athens, 12210 Egaleo, Greece

Table 1 Assignment of main infrared peaks (cm⁻¹) of standard materials and compounds

Absorption maximum (cm ⁻¹)		Assignment
Collagenous materials		
Collagen	Parchment	
3315 s, br	3302	Amide A: first component of νN-H in Fermi resonance with the amide II overtone (overlapping with ν _{as} O-H (3447 br) and ν _s O-H (3240 br) of structural H ₂ O)
3072, m-w, br	3072	Amide B: (second component of νN-H in Fermi resonance with the amide II overtone)
2958	2926	νC-H
1640 s	1644	Amide I: νC=O with small contributions from νC-N and δN-H) [overlapping with δH-O-H (approx. 1610) of structural H ₂ O] ^a
1545 s	1538	Amide II: (νC-N with contributions from δ _p N-H) ^b
1454 m-w	1448	δCH ₂ of Pro-
1405 w	1408	δ _p C-O-H (carboxylic side chains) and δNH ₂
1340 w	1334	wCH ₂ /δC-H (methine)
1241 m-w	1230	Amide III: (νC-N + δN-H with contributions from νC-C and δ _p C=O) ^b
1082, 1032	1084, 1031	Breathing of proline ring [68] with carbohydrate νC-O and νC-O-C (glycosylation sites) [69]/parchment: additional esters [70]
Gallic acid [40, 73, 74]		
3498		νO ₉ H, νO ₁₁ H
3366		νO ₁₀ H
3284		νO ₁₄ H (COOH)
3065, 2996, 2844		νC ₂ -H, νC ₆ -H
2673, 2632, 2575, 2512		νO ₁₄ H (-COOH dimers)
1703		νC=O
1668, 1648		νC=O (-COOH dimers)
1612, 1542, 1484, 1468, 1427, 1387, 1321		νC=C (aromatic ring vibrations)
1268		νC-O
1221		δ(i-p) C-O-H
1184		νC ₁ -C ₇ + νC-H
1099		νC ₁ -C ₇ + δC-O-H
1028		Aromatic <i>asym</i> -, <i>sym</i> -breathing, νC ₁ -C ₇ + νC-OH (phenol)
904		νC-O + δ(o-o-p) C-O-H (dimer band) + δ(o-o-p) of ring
867		δ(i-p) C-H
767		δ(o-o-p) C-H (out-of-phase)
735		δ(o-o-p) C-H (out-of-phase) + τC-OH (torsion)
703		Aromatic ring puckering
636		Aromatic ring puckering + δ(o-o-p) C-O-H (phenolic)
559		δ(o-o-p) C-O-H (phenolic)
492		τC—aromatic ring
Gum Arabic		
3352		νOH
2932		νC-H
1604		ν _{as} COO ⁻
1418		ν _s COO ⁻
1146(sh), 1068, 1035(sh)		νC-O
Iron (II) sulfate heptahydrate		
3336		νOH
1652		δOH in water

Table 1 continued

Iron (II) sulfate heptahydrate	
1092	$\nu_3 \text{SO}_4^{2-}$
977	$\nu_1 \text{SO}_4^{2-}$
619	$\nu_4 \text{(asym-)} \text{SO}_4^{2-}$
LIG ink formulation	
3415	νOH in water
1645	δOH in water
1094	$\nu_3 \text{SO}_4^{2-}$
977	$\nu_1 \text{SO}_4^{2-}$
628	$\nu_4 \text{(asym-)} \text{SO}_4^{2-}$
LIGG ink formulation	
3439	$\nu\text{H-O}$ in polysaccharide (gum Arabic) and water
2931	$\nu\text{C-H}$
1640	δOH in water overlapping with $\nu_{\text{as}}\text{COO}^-$ in polysaccharide (gum Arabic)
1424	$\nu_3\text{COO}^-$ in gum Arabic
1083	$\nu_3 \text{SO}_4^{2-}$ overlapping with $\nu\text{C-O}$ in gum Arabic
1146(sh), 1035(sh)	$\nu\text{C-O}$ in gum Arabic
604	$\nu_4 \text{(asym-)} \text{SO}_4^{2-}$

ν stretching, δ bending, d deformation, ip in-plane, sh shoulder

^a According to Ref. [24]

^b According to Refs. [24, 46]

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Reference

1. Boyatzis SC, Velivasaki G, Malea E. A study of the deterioration of aged parchment marked with laboratory iron gall inks using FTIR-ATR spectroscopy and micro hot table. *Herit Sci*. 2016;4:13. doi:[10.1186/s40494-016-0083-4](https://doi.org/10.1186/s40494-016-0083-4).

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