

Electronic Supplementary Information for: Combined SERS and Raman Analysis for the Identification of Red Pigments in Cross-Sections from Historic Oil Paintings

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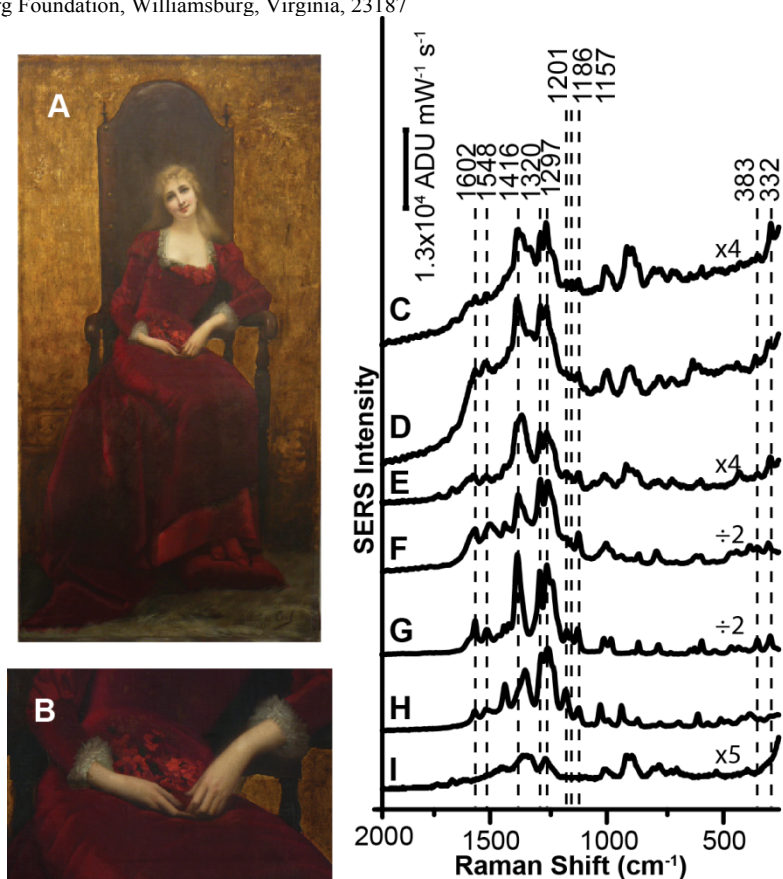


Figure S1. (A) *Young woman in a Red Dress* by Gabriel de Cool, 1890; (B) detail of flowers in sitter's lap; (C) SERS spectrum using 632.8 nm excitation from reference sample containing madder lake paint embedded in polyester resin; (D) SERS spectrum from dispersed paint sample from flowers in Figure B; (E) SERS spectrum from dispersed madder lake paint; (F) SERS spectrum from dispersed madder lake pigment; (G) SERS spectrum of dispersed alizarin pigment; (H) SERS spectrum of dispersed nurnurin pigment; (I) SERS spectrum of dispersed madder lake pigment.

Table S1. Discriminant bands of carmine lake, madder lake, art samples, Ag colloids, and bioplast. Abbreviations: w, weak; m, moderate; s, strong

Carmine lake (cm⁻¹)	Carmine lake and vermilion mixture (cm⁻¹)	<i>Elizabeth Burwell Nelson</i> (Feke) sample (cm⁻¹)	<i>Portrait of Issac Barré</i> (Reynolds) sample (cm⁻¹) (organic layer) (cm⁻¹)	<i>Portrait of Issac Barré</i> (Reynolds) Sample (cm⁻¹) (inorganic layer) (cm⁻¹)	Madder lake (cm⁻¹)	<i>Young Woman in a Red Dress</i> (De Cool) Dispersed sample (cm⁻¹)	Typical dry Ag colloids (cm⁻¹)	Bioplast (cm⁻¹)
1453 w	1460 w	1452 w	1454 w	350 m	1602 w	1603 w	1484 m	1767 m
1422 w	1430 w	1422 w	1434 w	259 s	1548 w	1551 w	1393 m	1652 m
1297 s	1296 s	1300 s	1298 s	(Raman bands)	1416 s	1422 s	1298 m	1701 m
1102 w	1103 w	1103 w	1105 w		1320 s	1322 s	*1047 m	1767 m
1085 w	1088 w	1084 w	1079 w		1297 s	1295 s	*949 m	(Raman bands)
671 m	679 m	674 m	677 m		1210 w	1215 w	*812 m	
466 m	477 m	465 m	473 m		1186 w	1186 w	*732 m	
431 m	431m	430 m	436 m		1157 w	1158 w		
	353 m				383 w	399 w	*denotes citrate peaks	
	254 s				332 m	339 m		