

Supplemental Information

for

Performance Evaluation of Handheld Raman Spectroscopy for Cocaine Detection in Forensic Case Samples

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Table S1. Results TruNarc scans for diluted cocaine samples.

Table S2. Results TruNarc scans for drugs-of-abuse compounds, cutting agents and non-cocaine mixtures.

Table S3. Results TruNarc scans for cocaine-containing case samples.

Figure S1. False-negative results of the TruNarc handheld Raman spectrometer for binary cocaine mixtures with 8 common cutting-agents at concentrations ranging from 10 – 100 wt% cocaine.

Figure S2. Raman spectra of 5 replicate scans of a single cocaine HCl sample.

Figure S3. Raman spectra of cocaine and common cutting agents.

Table S2. Results TruNarc scans for drugs-of-abuse compounds, cutting agents and non-cocaine mixtures.

scan	composition	Raman result	type	scan	composition	Raman result	type
PURE1-1	cocaine HCl	cocaine HCl	TP	NEG3-1	levamisole	levamisole	TN
PURE1-2	cocaine HCl	cocaine HCl	TP	NEG3-2	levamisole	levamisole	TN
PURE1-3	cocaine HCl	cocaine HCl	TP	NEG3-3	levamisole	levamisole	TN
PURE1-4	cocaine HCl	cocaine HCl	TP	NEG4-1	lidocaine	lidocaine	TN
PURE1-5	cocaine HCl	cocaine HCl	TP	NEG4-2	lidocaine	lidocaine	TN
PURE2-1	cocaine base	cocaine base	TP	NEG4-3	lidocaine	lidocaine	TN
PURE2-2	cocaine base	cocaine base	TP	NEG5-1	phenacetin	phenacetin	TN
PURE2-3	cocaine base	cocaine base	TP	NEG5-2	phenacetin	phenacetin	TN
PURE2-4	cocaine base	cocaine base	TP	NEG5-3	phenacetin	phenacetin	TN
PURE2-5	cocaine base	cocaine base	TP	NEG6-1	procaine	procaine	TN
PURE3-1	GHB (liquid)	GHB	TP	NEG6-2	procaine	procaine	TN
PURE3-2	GHB (liquid)	GHB	TP	NEG6-3	procaine	procaine	TN
PURE3-3	GHB (liquid)	GHB	TP	NEG7-1	benzocaine	benzocaine	TN
PURE3-4	GHB (liquid)	GHB	TP	NEG7-2	benzocaine	benzocaine	TN
PURE3-5	GHB (liquid)	GHB	TP	NEG7-3	benzocaine	benzocaine	TN
PURE4-1	GHB (pure)	GHB	TP	NEG8-1	mannitol	mannitol	TN
PURE4-2	GHB (pure)	GHB	TP	NEG8-2	mannitol	mannitol	TN
PURE4-3	GHB (pure)	GHB	TP	NEG8-3	mannitol	mannitol	TN
PURE4-4	GHB (pure)	GHB	TP	NEG9-1	lactose	lactose	TN
PURE4-5	GHB (pure)	GHB	TP	NEG9-2	lactose	lactose	TN
PURE5-1	Heroin (white)	Heroin	TP	NEG9-3	lactose	lactose	TN
PURE5-2	Heroin (white)	Heroin	TP	NEG10-1	vitamin C	vitamin c	TN
PURE5-3	Heroin (white)	Heroin	TP	NEG10-2	vitamin C	vitamin c	TN
PURE5-4	Heroin (white)	Heroin	TP	NEG10-3	vitamin C	vitamin c	TN
PURE5-5	Heroin (white)	Heroin	TP	NEG11-1	sugar (powdered)	confectioner's sugar	TN
PURE6-1	Heroin (brown)	Inconclusive	inconclusive	NEG11-2	sugar (powdered)	confectioner's sugar	TN
PURE6-2	Heroin (brown)	Inconclusive	inconclusive	NEG11-3	sugar (powdered)	confectioner's sugar	TN
PURE6-3	Heroin (brown)	Inconclusive	inconclusive	NEG12-1	glucose	dextrose	TN
PURE6-4	Heroin (brown)	Inconclusive	inconclusive	NEG12-2	glucose	dextrose	TN
PURE6-5	Heroin (brown)	Inconclusive	inconclusive	NEG12-3	glucose	dextrose	TN
PURE7-1	MDMA	Inconclusive	inconclusive	NEG13-1	boric acid	boric acid	TN
PURE7-2	MDMA	Inconclusive	inconclusive	NEG13-2	boric acid	boric acid	TN
PURE7-3	MDMA	MDMA	TP	NEG13-3	boric acid	boric acid	TN
PURE7-4	MDMA	MDMA	TP	NEG14-1	diltiazem	diltiazem	TN
PURE7-5	MDMA	Inconclusive	inconclusive	NEG14-2	diltiazem	diltiazem	TN
PURE8-1	Methamphetamine	Methamphetamine	TP	NEG14-3	diltiazem	diltiazem	TN
PURE8-2	Methamphetamine	Methamphetamine	TP	NEG15-1	prometazine	inconclusive	inconclusive
PURE8-3	Methamphetamine	Methamphetamine	TP	NEG15-2	prometazine	inconclusive	inconclusive
PURE8-4	Methamphetamine	Methamphetamine	TP	NEG15-3	prometazine	inconclusive	inconclusive
PURE8-5	Methamphetamine	Methamphetamine	TP	NEG16-1	non-dairy creamer	inconclusive	inconclusive
PURE9-1	Amphetamine	Amphetamine	TP	NEG16-2	non-dairy creamer	inconclusive	inconclusive
PURE9-2	Amphetamine	Amphetamine	TP	NEG16-3	non-dairy creamer	inconclusive	inconclusive
PURE9-3	Amphetamine	Amphetamine	TP	NEG17-1	wheat flour	corn starch	TN
PURE9-4	Amphetamine	Amphetamine	TP	NEG17-2	wheat flour	corn starch	TN
PURE9-5	Amphetamine	Amphetamine	TP	NEG17-3	wheat flour	corn starch	TN
PURE10-1	2C-B	2C-B	TP	NEG18-1	acetylsalicylic acid	aspirin	TN
PURE10-2	2C-B	2C-B	TP	NEG18-2	acetylsalicylic acid	aspirin	TN
PURE10-3	2C-B	2C-B	TP	NEG18-3	acetylsalicylic acid	aspirin	TN
PURE10-4	2C-B	2C-B	TP	NEG19-1	ketamine	ketamine	TN
PURE10-5	2C-B	2C-B	TP	NEG19-2	ketamine	ketamine	TN
PURE11-1	3-CMC	3-chloromethcathinone	TN	NEG19-3	ketamine	ketamine	TN
PURE11-2	3-CMC	3-chloromethcathinone	TN	NEG20-1	amphetamine	amphetamine	TP
PURE11-3	3-CMC	3-chloromethcathinone	TN	NEG20-2	amphetamine	amphetamine	TP
PURE11-4	3-CMC	3-chloromethcathinone	TN	NEG20-3	amphetamine	amphetamine	TP
PURE11-5	3-CMC	3-chloromethcathinone	TN	NEG21-1	MDMA (powder)	inconclusive	inconclusive
PURE12-1	4-CMC	4-chloromethcathinone	TN	NEG21-2	MDMA (powder)	inconclusive	inconclusive
PURE12-2	4-CMC	4-chloromethcathinone	TN	NEG21-3	MDMA (powder)	MDMA	TP
PURE12-3	4-CMC	4-chloromethcathinone	TN	NEG22-1	methamphetamine	methamphetamine	TP
PURE12-4	4-CMC	4-chloromethcathinone	TN	NEG22-2	methamphetamine	methamphetamine	TP
PURE12-5	4-CMC	4-chloromethcathinone	TN	NEG22-3	methamphetamine	methamphetamine	TP
PURE13-1	6-APB	inconclusive	inconclusive	NEG23-1	heroin (white)	heroin	TP
PURE13-2	6-APB	inconclusive	inconclusive	NEG23-2	heroin (white)	heroin	TP
PURE13-3	6-APB	inconclusive	inconclusive	NEG23-3	heroin (white)	heroin	TP
PURE13-4	6-APB	inconclusive	inconclusive	NEG24-1	sildenafil citrate tablet	inconclusive	inconclusive
PURE13-5	6-APB	inconclusive	inconclusive	NEG24-2	sildenafil citrate tablet	inconclusive	inconclusive
PURE14-1	2-FMA	2-fluoromethamphetamine	TN	NEG24-3	sildenafil citrate tablet	inconclusive	inconclusive
PURE14-2	2-FMA	2-fluoromethamphetamine	TN	NEG25-1	oxazepam tablet	oxazepam	TP
PURE14-3	2-FMA	2-fluoromethamphetamine	TN	NEG25-2	oxazepam tablet	oxazepam	TP
PURE14-4	2-FMA	2-fluoromethamphetamine	TN	NEG25-3	oxazepam tablet	oxazepam	TP
PURE14-5	2-FMA	2-fluoromethamphetamine	TN	NEG26-1	temazepam tablet	clear lactose cellulose	FN
PURE15-1	4-FA	4-fluoroamphetamine	TP	NEG26-2	temazepam tablet	flunitrazepam	FP
PURE15-2	4-FA	4-fluoroamphetamine	TP	NEG26-3	temazepam tablet	flunitrazepam	FP
PURE15-3	4-FA	4-fluoroamphetamine	TP	NEG27-1	mephedrone	mephedrone	TP

PURE15-4	4-FA	4-fluoroamphetamine	TP	NEG27-2	mephedrone	mephedrone	TP
PURE15-5	4-FA	4-fluoroamphetamine	TP	NEG27-3	mephedrone	mephedrone	TP
PURE16-1	ketamine	ketamine	TN	NEG28-1	4-FA	4-FA	TP
PURE16-2	ketamine	ketamine	TN	NEG28-2	4-FA	4-FA	TP
PURE16-3	ketamine	ketamine	TN	NEG28-3	4-FA	4-FA	TP
PURE16-4	ketamine	ketamine	TN	NEG29-1	paracetamol :cafein, 1:1	paracetamol	TN
PURE16-5	ketamine	ketamine	TN	NEG29-2	paracetamol :cafein, 1:1	paracetamol	TN
PURE17-1	3-MEC	inconclusive	inconclusive	NEG29-3	paracetamol :cafein, 1:1	paracetamol	TN
PURE17-2	3-MEC	inconclusive	inconclusive	NEG30-1	levamisole:lidocaine, 1:1	levamisole, lidocaine	TN
PURE17-3	3-MEC	inconclusive	inconclusive	NEG30-2	levamisole:lidocaine, 1:1	levamisole, lidocaine	TN
PURE17-4	3-MEC	inconclusive	inconclusive	NEG30-3	levamisole:lidocaine, 1:1	levamisole, lidocaine	TN
PURE17-5	3-MEC	inconclusive	inconclusive	NEG31-1	levamisole:paracetamol:lidocaine, 1:1:1	paracetamol	TN
PURE18-1	4-MEC	4-methylethcathinone	TP	NEG31-2	levamisole:paracetamol:lidocaine, 1:1:1	paracetamol	TN
PURE18-2	4-MEC	4-methylethcathinone	TP	NEG31-3	levamisole:paracetamol:lidocaine, 1:1:1	paracetamol	TN
PURE18-3	4-MEC	4-methylethcathinone	TP	NEG32-1	levamisole:phenacetin, 1:1	phenacetin, levamisole	TN
PURE18-4	4-MEC	4-methylethcathinone	TP	NEG32-2	levamisole:phenacetin, 1:1	phenacetin, levamisole	TN
PURE18-5	4-MEC	4-methylethcathinone	TP	NEG32-3	levamisole:phenacetin, 1:1	phenacetin, levamisole	TN
PURE19-1	2-MMC	2-methylmethcathinone	TN	NEG33-1	phenacetin:lidocaine, 1:1	phenacetin, lidocaine	TN
PURE19-2	2-MMC	2-methylmethcathinone	TN	NEG33-2	phenacetin:lidocaine, 1:1	phenacetin, lidocaine	TN
PURE19-3	2-MMC	2-methylmethcathinone	TN	NEG33-3	phenacetin:lidocaine, 1:1	phenacetin, lidocaine	TN
PURE19-4	2-MMC	2-methylmethcathinone	TN	NEG34-1	phenacetin:procaine, 1:1	procaine, phenacetin	TN
PURE19-5	2-MMC	2-methylmethcathinone	TN	NEG34-2	phenacetin:procaine, 1:1	procaine, phenacetin	TN
PURE20-1	3-MMC	3-methylmethcathinone	TN	NEG34-3	phenacetin:procaine, 1:1	procaine, phenacetin	TN
PURE20-2	3-MMC	3-methylmethcathinone	TN	NEG35-1	levamisole:phenacetin:procaine, 1:1:1	levamisole, procaine,	TN
PURE20-3	3-MMC	3-methylmethcathinone	TN	NEG35-2	levamisole:phenacetin:procaine, 1:1:1	levamisole, procaine,	TN
PURE20-4	3-MMC	3-methylmethcathinone	TN	NEG35-3	levamisole:phenacetin:procaine, 1:1:1	levamisole, procaine,	TN
PURE20-5	3-MMC	3-methylmethcathinone	TN	NEG36-1	paracetamol:phenacetin, 1:1	paracetamol	TN
PURE21-1	4-MMC	mephedrone	TP	NEG36-2	paracetamol:phenacetin, 1:1	paracetamol	TN
PURE21-2	4-MMC	mephedrone	TP	NEG36-3	paracetamol:phenacetin, 1:1	paracetamol	TN
PURE21-3	4-MMC	mephedrone	TP	NEG37-1	diazepam tablet 10 mg	diazepam	TN
PURE21-4	4-MMC	mephedrone	TP	NEG37-2	diazepam tablet 10 mg	diazepam	TN
PURE21-5	4-MMC	mephedrone	TP	NEG37-3	diazepam tablet 10 mg	diazepam	TN
NEG1-1	paracetamol	paracetamol	TN	NEG38-1	methylphenidate 10 mg tablet	inconclusive	inconclusive
NEG1-2	paracetamol	paracetamol	TN	NEG38-2	methylphenidate 10 mg tablet	inconclusive	inconclusive
NEG1-3	paracetamol	paracetamol	TN	NEG38-3	methylphenidate 10 mg tablet	inconclusive	inconclusive
NEG2-1	caffeine	caffeine	TN	NEG39-1	smartshop blend mix caffeine,	mannitol caffeine	TN
NEG2-2	caffeine	caffeine	TN	NEG39-2	smartshop blend mix caffeine,	mannitol caffeine	TN
NEG2-3	caffeine	caffeine	TN	NEG39-3	smartshop blend mix caffeine,	mannitol caffeine	TN

Table S3. Results TruNarc scans for cocaine-containing case samples.

scan	composition	Raman result	type
POS2-1	cocaine base (78.2%), levamisole	Cocaine base	TP
POS2-2	cocaine base (78.2%), levamisole	Cocaine base	TP
POS2-3	cocaine base (78.2%), levamisole	Cocaine base	TP
POS3-1	cocaine HCl (63.2%), levamisole	Cocaine HCl	TP
POS3-2	cocaine HCl (63.2%), levamisole	Cocaine HCl	TP
POS3-3	cocaine HCl (63.2%), levamisole	Cocaine HCl	TP
POS4-1	cocaine HCl (80%), caffein	Cocaine HCl	TP
POS4-2	cocaine HCl (80%), caffein	Cocaine HCl	TP
POS4-3	cocaine HCl (80%), caffein	Cocaine HCl	TP
POS5-1	cocaine HCl (43.8%), levamisole, inositol	Cocaine HCl	TP
POS5-2	cocaine HCl (43.8%), levamisole, inositol	Cocaine HCl	TP
POS5-3	cocaine HCl (43.8%), levamisole, inositol	Cocaine HCl	TP
POS6-1	cocaine HCl (79.6%)	Cocaine HCl	TP
POS6-2	cocaine HCl (79.6%)	Cocaine HCl	TP
POS6-3	cocaine HCl (79.6%)	Cocaine HCl	TP
POS10-1	cocaine base (55.4%), phenacetin, levamisole	Cocaine HCl	TP
POS10-2	cocaine base (55.4%), phenacetin, levamisole	Cocaine HCl	TP
POS10-3	cocaine base (55.4%), phenacetin, levamisole	Cocaine base	TP
POS11-1	cocaine HCl (45.2%), paracetamol	Cocaine HCl	TP
POS11-2	cocaine HCl (45.2%), paracetamol	Cocaine HCl	TP
POS11-3	cocaine HCl (45.2%), paracetamol	Cocaine HCl	TP
POS12-1	cocaine HCl (58.2%), glucose	Cocaine HCl	TP
POS12-2	cocaine HCl (58.2%), glucose	Cocaine HCl	TP
POS12-3	cocaine HCl (58.2%), glucose	Cocaine HCl	TP
POS13-1	cocaine base (94.2%)	Cocaine base	TP
POS13-2	cocaine base (94.2%)	Cocaine base	TP
POS13-3	cocaine base (94.2%)	Cocaine base	TP
POS14-1	cocaine base (68%), caffein, phenacetin, levamisole	Cocaine base	TP
POS14-2	cocaine base (68%), caffein, phenacetin, levamisole	Cocaine base	TP
POS14-3	cocaine base (68%), caffein, phenacetin, levamisole	Cocaine base	TP
POS15-1	cocaine HCl (81.4%), levamisole	Cocaine HCl	TP
POS15-2	cocaine HCl (81.4%), levamisole	Cocaine HCl	TP
POS15-3	cocaine HCl (81.4%), levamisole	Cocaine HCl	TP
POS17-1	cocaine HCl (39.6%), phenacetin,hydroxyzine, inositol	Cocaine HCl	TP
POS17-2	cocaine HCl (39.6%), phenacetin,hydroxyzine, inositol	Cocaine HCl	TP
POS17-3	cocaine HCl (39.6%), phenacetin,hydroxyzine, inositol	Cocaine HCl	TP
POS19-1	cocaine HCl (47.2%), caffein, phenacetin, tetracaine	Cocaine HCl	TP
POS19-2	cocaine HCl (47.2%), caffein, phenacetin, tetracaine	Cocaine HCl	TP
POS19-3	cocaine HCl (47.2%), caffein, phenacetin, tetracaine	Cocaine HCl	TP
POS20-1	cocaine HCl (80.7%)	Cocaine HCl	TP
POS20-2	cocaine HCl (80.7%)	Cocaine HCl	TP
POS20-3	cocaine HCl (80.7%)	Cocaine HCl	TP
POS21-1	cocaine HCl (81.1%)	Cocaine HCl	TP
POS21-2	cocaine HCl (81.1%)	Cocaine HCl	TP
POS21-3	cocaine HCl (81.1%)	Cocaine HCl	TP
POS22-1	cocaine HCl (74.2%), levamisole	Cocaine HCl	TP
POS22-2	cocaine HCl (74.2%), levamisole	Cocaine HCl	TP
POS22-3	cocaine HCl (74.2%), levamisole	Cocaine HCl	TP
POS24-1	cocaine HCl (80.8%)	Cocaine HCl	TP
POS24-2	cocaine HCl (80.8%)	Cocaine HCl	TP
POS24-3	cocaine HCl (80.8%)	Cocaine HCl	TP
POS26-1	cocaine base (58.5%), caffein, phenacetin, levamisole	Cocaine base	TP
POS26-2	cocaine base (58.5%), caffein, phenacetin, levamisole	Cocaine base	TP
POS26-3	cocaine base (58.5%), caffein, phenacetin, levamisole	Cocaine base	TP
POS29-1	cocaine base (99.4%)	Cocaine base	TP
POS29-2	cocaine base (99.4%)	Cocaine base	TP
POS29-3	cocaine base (99.4%)	Cocaine base	TP
POS30-1	cocaine HCl (79.1%)	Cocaine HCl	TP
POS30-2	cocaine HCl (79.1%)	Cocaine HCl	TP
POS30-3	cocaine HCl (79.1%)	Cocaine HCl	TP
POS31-1	cocaine base (62.1%), phenacetin, levamisole	Cocaine base	TP
POS31-2	cocaine base (62.1%), phenacetin, levamisole	Cocaine base	TP
POS31-3	cocaine base (62.1%), phenacetin, levamisole	Cocaine base	TP
POS33-1	cocaine HCl (68.4%), levamisole	Cocaine HCl	TP
POS33-2	cocaine HCl (68.4%), levamisole	Cocaine HCl	TP
POS33-3	cocaine HCl (68.4%), levamisole	Cocaine HCl	TP
POS34-1	cocaine base (95.9%)	Cocaine base	TP
POS34-2	cocaine base (95.9%)	Cocaine base	TP
POS34-3	cocaine base (95.9%)	Cocaine base	TP
POS35-1	cocaine HCl (29.6%), levamisole, lactose	Cocaine HCl	TP
POS35-2	cocaine HCl (29.6%), levamisole, lactose	Cocaine HCl	TP
POS35-3	cocaine HCl (29.6%), levamisole, lactose	Cocaine HCl	TP
POS36-1	cocaine base (85.9%), phenacetin	Cocaine base	TP

POS36-2	cocaine base (85.9%), phenacetin	Cocaine base	TP
POS36-3	cocaine base (85.9%), phenacetin	Cocaine base	TP
POS38-1	cocaine HCl (83.3%)	Cocaine HCl	TP
POS38-2	cocaine HCl (83.3%)	Cocaine HCl	TP
POS38-3	cocaine HCl (83.3%)	Cocaine HCl	TP
POS39-1	cocaine base (99.2%)	Cocaine base	TP
POS39-2	cocaine base (99.2%)	Cocaine base	TP
POS39-3	cocaine base (99.2%)	Cocaine base	TP
POS40-1	cocaine base (85.6%), levamisole	Cocaine base	TP
POS40-2	cocaine base (85.6%), levamisole	Cocaine base	TP
POS40-3	cocaine base (85.6%), levamisole	Cocaine base	TP
POS43-1	cocaine HCl (63.4%) mannitol	Cocaine HCl	TP
POS43-2	cocaine HCl (63.4%) mannitol	Cocaine HCl	TP
POS43-3	cocaine HCl (63.4%) mannitol	Cocaine HCl	TP
POS44-1	cocaine HCl (82.8%)	Cocaine HCl	TP
POS44-2	cocaine HCl (82.8%)	Cocaine HCl	TP
POS44-3	cocaine HCl (82.8%)	Cocaine HCl	TP
POS45-1	cocaine base (98.2%)	Cocaine base	TP
POS45-2	cocaine base (98.2%)	Cocaine base	TP
POS45-3	cocaine base (98.2%)	Cocaine base	TP
POS47-1	cocaine HCl (46.1%), levamisole, inositol, mannitol	Cocaine HCl	TP
POS47-2	cocaine HCl (46.1%), levamisole, inositol, mannitol	Cocaine HCl	TP
POS47-3	cocaine HCl (46.1%), levamisole, inositol, mannitol	Cocaine HCl	TP
POS48-1	cocaine HCl (79.6%), levamisole	Cocaine HCl	TP
POS48-2	cocaine HCl (79.6%), levamisole	Cocaine HCl	TP
POS48-3	cocaine HCl (79.6%), levamisole	Cocaine HCl	TP
POS49-1	cocaine HCl (85.6%), phenacetin	Cocaine HCl	TP
POS49-2	cocaine HCl (85.6%), phenacetin	Cocaine HCl	TP
POS49-3	cocaine HCl (85.6%), phenacetin	Cocaine HCl	TP
POS51-1	cocaine HCl (45.3%), caffen, phenacetin, mannitol	Cocaine HCl	TP
POS51-2	cocaine HCl (45.3%), caffen, phenacetin, mannitol	Cocaine HCl	TP
POS51-3	cocaine HCl (45.3%), caffen, phenacetin, mannitol	Cocaine HCl	TP
POS52-1	cocaine base (98%)	Cocaine base	TP
POS52-2	cocaine base (98%)	Cocaine base	TP
POS52-3	cocaine base (98%)	Cocaine base	TP
POS54-1	cocaine HCl (55.8%), phenacetin, levamisole	Cocaine HCl	TP
POS54-2	cocaine HCl (55.8%), phenacetin, levamisole	Cocaine HCl	TP
POS54-3	cocaine HCl (55.8%), phenacetin, levamisole	Cocaine HCl	TP
POS55-1	cocaine HCl (28.2%), caffen, phenacetin, levamisole, inositol	Cocaine HCl	TP
POS55-2	cocaine HCl (28.2%), caffen, phenacetin, levamisole, inositol	Cocaine HCl	TP
POS55-3	cocaine HCl (28.2%), caffen, phenacetin, levamisole, inositol	Cocaine HCl	TP
POS56-1	cocaine HCl (51.9%), levamisole, inositol	Cocaine HCl	TP
POS56-2	cocaine HCl (51.9%), levamisole, inositol	Cocaine HCl	TP
POS56-3	cocaine HCl (51.9%), levamisole, inositol	Cocaine HCl	TP
POS57-1	cocaine HCl (44.3%) inositol	Cocaine HCl	TP
POS57-2	cocaine HCl (44.3%) inositol	Cocaine HCl	TP
POS57-3	cocaine HCl (44.3%) inositol	Cocaine HCl	TP
POS58-1	cocaine HCl (19.1%), lidocaine, mannitol	Lidocaine, Mannitol	FN
POS58-2	cocaine HCl (19.1%), lidocaine, mannitol	Cocaine HCl	TP
POS58-3	cocaine HCl (19.1%), lidocaine, mannitol	Cocaine	TP
POS59-1	cocaine base (53.4%), caffen, phenacetin	Cocaine base	TP
POS59-2	cocaine base (53.4%), caffen, phenacetin	Cocaine base	TP
POS59-3	cocaine base (53.4%), caffen, phenacetin	Cocaine base	TP
POS60-1	cocaine base (69.2%), phenacetin	Cocaine base	TP
POS60-2	cocaine base (69.2%), phenacetin	Cocaine base	TP
POS60-3	cocaine base (69.2%), phenacetin	Cocaine base	TP
POS61-1	cocaine base (56.1%), phenacetin, levamisole	Cocaine base	TP
POS61-2	cocaine base (56.1%), phenacetin, levamisole	Cocaine base	TP
POS61-3	cocaine base (56.1%), phenacetin, levamisole	Cocaine base	TP
POS62-1	cocaine base (71.1%), phenacetin	Cocaine base	TP
POS62-2	cocaine base (71.1%), phenacetin	Cocaine base	TP
POS62-3	cocaine base (71.1%), phenacetin	Cocaine base	TP
POS63-1	cocaine HCl (79.3%)	Cocaine HCl	TP
POS63-2	cocaine HCl (79.3%)	Cocaine HCl	TP
POS63-3	cocaine HCl (79.3%)	Cocaine HCl	TP
POS66-1	cocaine HCl (76.3%) inositol	Cocaine HCl	TP
POS66-2	cocaine HCl (76.3%) inositol	Cocaine HCl	TP
POS66-3	cocaine HCl (76.3%) inositol	Cocaine HCl	TP
POS67-1	cocaine HCl (85.5%)	Cocaine HCl	TP
POS67-2	cocaine HCl (85.5%)	Cocaine HCl	TP
POS67-3	cocaine HCl (85.5%)	Cocaine HCl	TP
POS68-1	cocaine base (89.1%)	Cocaine base	TP
POS68-2	cocaine base (89.1%)	Cocaine base	TP
POS68-3	cocaine base (89.1%)	Cocaine base	TP
POS69-1	cocaine HCl (47.6%), caffen, phenacetin, mannitol	Cocaine HCl	TP
POS69-2	cocaine HCl (47.6%), caffen, phenacetin, mannitol	Cocaine HCl	TP

POS69-3	cocaine HCl (47.6%), caffein, phenacetin, mannitol	Cocaine HCl	TP
POS70-1	cocaine base (85.9%), phenacetin	Cocaine base	TP
POS70-2	cocaine base (85.9%), phenacetin	Cocaine base	TP
POS70-3	cocaine base (85.9%), phenacetin	Cocaine base	TP
POS71-1	cocaine HCl (60.3%), levamisole	Cocaine HCl	TP
POS71-2	cocaine HCl (60.3%), levamisole	Cocaine HCl	TP
POS71-3	cocaine HCl (60.3%), levamisole	Cocaine HCl	TP
POS72-1	cocaine base (85.4%)	Cocaine base	TP
POS72-2	cocaine base (85.4%)	Cocaine base	TP
POS72-3	cocaine base (85.4%)	Cocaine base	TP
POS73-1	cocaine base (80%), levamisole	Cocaine base	TP
POS73-2	cocaine base (80%), levamisole	Cocaine base	TP
POS73-3	cocaine base (80%), levamisole	Cocaine base	TP
POS74-1	cocaine HCl (66.3%), lidocaine	Cocaine HCl	TP
POS74-2	cocaine HCl (66.3%), lidocaine	Cocaine HCl	TP
POS74-3	cocaine HCl (66.3%), lidocaine	Cocaine HCl	TP
POS75-1	cocaine HCl (22.5%), caffein, levamisole, inositol, mannitol	Cocaine HCl	TP
POS75-2	cocaine HCl (22.5%), caffein, levamisole, inositol, mannitol	Cocaine HCl	TP
POS75-3	cocaine HCl (22.5%), caffein, levamisole, inositol, mannitol	Cocaine HCl	TP
POS76-1	cocaine HCl (45.4%), levamisole, inositol	Cocaine HCl	TP
POS76-2	cocaine HCl (45.4%), levamisole, inositol	Cocaine HCl	TP
POS76-3	cocaine HCl (45.4%), levamisole, inositol	Cocaine HCl	TP
POS77-1	cocaine HCl (69.4%), lidocaine, inositol, mannitol	Cocaine HCl	TP
POS77-2	cocaine HCl (69.4%), lidocaine, inositol, mannitol	Cocaine HCl	TP
POS77-3	cocaine HCl (69.4%), lidocaine, inositol, mannitol	Cocaine HCl	TP
POS80-1	cocaine base (68.8%), phenacetin	Cocaine base	TP
POS80-2	cocaine base (68.8%), phenacetin	Cocaine base	TP
POS80-3	cocaine base (68.8%), phenacetin	Cocaine base	TP
POS82-1	cocaine HCl (80.6%)	Cocaine HCl	TP
POS82-2	cocaine HCl (80.6%)	Cocaine HCl	TP
POS82-3	cocaine HCl (80.6%)	Cocaine HCl	TP
POS83-1	cocaine HCl (24.6%), levamisole	Cocaine HCl	TP
POS83-2	cocaine HCl (24.6%), levamisole	Cocaine HCl	TP
POS83-3	cocaine HCl (24.6%), levamisole	Cocaine HCl	TP
POS84-1	cocaine base (79.7%), phenacetin, levamisole	Cocaine base	TP
POS84-2	cocaine base (79.7%), phenacetin, levamisole	Cocaine base	TP
POS84-3	cocaine base (79.7%), phenacetin, levamisole	Cocaine base	TP
POS85-1	cocaine base (66.9%), levamisole	Cocaine base	TP
POS85-2	cocaine base (66.9%), levamisole	Cocaine base	TP
POS85-3	cocaine base (66.9%), levamisole	Cocaine base	TP
POS86-1	cocaine base (75.8%), phenacetin	Cocaine base	TP
POS86-2	cocaine base (75.8%), phenacetin	Cocaine base	TP
POS86-3	cocaine base (75.8%), phenacetin	Cocaine base	TP
POS87-1	cocaine base (98.1%)	Cocaine base	TP
POS87-2	cocaine base (98.1%)	Cocaine base	TP
POS87-3	cocaine base (98.1%)	Cocaine base	TP
POS88-1	cocaine HCl (64.1%), phenacetin, levamisole, inositol, mannitol	Cocaine HCl	TP
POS88-2	cocaine HCl (64.1%), phenacetin, levamisole, inositol, mannitol	Cocaine HCl	TP
POS88-3	cocaine HCl (64.1%), phenacetin, levamisole, inositol, mannitol	Cocaine HCl	TP
POS89-1	cocaine HCl (63.4%), levamisole	Cocaine HCl	TP
POS89-2	cocaine HCl (63.4%), levamisole	Cocaine HCl	TP
POS89-3	cocaine HCl (63.4%), levamisole	Cocaine HCl	TP
POS90-1	cocaine HCl (62.6%), caffein, levamisole	Cocaine HCl	TP
POS90-2	cocaine HCl (62.6%), caffein, levamisole	Cocaine HCl	TP
POS90-3	cocaine HCl (62.6%), caffein, levamisole	Cocaine HCl	TP
POS92-1	cocaine HCl (72.7%), inositol	Cocaine HCl	TP
POS92-2	cocaine HCl (72.7%), inositol	Cocaine HCl	TP
POS92-3	cocaine HCl (72.7%), inositol	Cocaine HCl	TP
POS93-1	cocaine HCl (83.9%)	Cocaine HCl	TP
POS93-2	cocaine HCl (83.9%)	Cocaine HCl	TP
POS93-3	cocaine HCl (83.9%)	Cocaine HCl	TP
POS94-1	cocaine base (51.4%), phenacetin, levamisole	Cocaine base	TP
POS94-2	cocaine base (51.4%), phenacetin, levamisole	Cocaine base	TP
POS94-3	cocaine base (51.4%), phenacetin, levamisole	Cocaine base	TP
POS95-1	cocaine HCl (80.4%)	Cocaine HCl	TP
POS95-2	cocaine HCl (80.4%)	Cocaine HCl	TP
POS95-3	cocaine HCl (80.4%)	Cocaine HCl	TP
POS99-1	cocaine base (48.8%), phenacetin	Cocaine base	TP
POS99-2	cocaine base (48.8%), phenacetin	Cocaine base	TP
POS99-3	cocaine base (48.8%), phenacetin	Cocaine base	TP
POS105-1	cocaine HCl (85.4%)	Cocaine HCl	TP
POS105-2	cocaine HCl (85.4%)	Cocaine HCl	TP
POS105-3	cocaine HCl (85.4%)	Cocaine HCl	TP
POS106-1	cocaine base (93.1%)	Cocaine base	TP
POS106-2	cocaine base (93.1%)	Cocaine base	TP
POS106-3	cocaine base (93.1%)	Cocaine base	TP

POS109-1	cocaine base (31.5%), levamisole	Inconclusive	inconclusive
POS109-2	cocaine base (31.5%), levamisole	Inconclusive	inconclusive
POS109-3	cocaine base (31.5%), levamisole	Inconclusive	inconclusive
POS109-4	cocaine base (31.5%), levamisole	Inconclusive	inconclusive
POS111-1	cocaine base (82.4%)	Cocaine base	TP
POS111-2	cocaine base (82.4%)	Cocaine base	TP
POS111-3	cocaine base (82.4%)	Cocaine base	TP
POS112-1	cocaine HCl (68.4%)	Cocaine HCl	TP
POS112-2	cocaine HCl (68.4%)	Cocaine HCl	TP
POS112-3	cocaine HCl (68.4%)	Cocaine HCl	TP
POS113-1	cocaine HCl (63.4%), levamisole, procaine	Cocaine HCl	TP
POS113-2	cocaine HCl (63.4%), levamisole, procaine	Cocaine HCl	TP
POS113-3	cocaine HCl (63.4%), levamisole, procaine	Cocaine HCl	TP
POS115-1	cocaine HCl (84%)	Cocaine HCl	TP
POS115-2	cocaine HCl (84%)	Cocaine HCl	TP
POS115-3	cocaine HCl (84%)	Cocaine HCl	TP
POS116-1	cocaine HCl (72.6%)	Cocaine HCl	TP
POS116-2	cocaine HCl (72.6%)	Cocaine HCl	TP
POS116-3	cocaine HCl (72.6%)	Cocaine HCl	TP
POS117-1	cocaine HCl (67.9%), levamisole	Cocaine HCl	TP
POS117-2	cocaine HCl (67.9%), levamisole	Cocaine HCl	TP
POS117-3	cocaine HCl (67.9%), levamisole	Cocaine HCl	TP
POS118-1	cocaine HCl (83%)	Cocaine HCl	TP
POS118-2	cocaine HCl (83%)	Cocaine HCl	TP
POS118-3	cocaine HCl (83%)	Cocaine HCl	TP
POS119-1	cocaine base (48.8%), phenacetin, levamisole	Cocaine base	TP
POS119-2	cocaine base (48.8%), phenacetin, levamisole	Cocaine base	TP
POS119-3	cocaine base (48.8%), phenacetin, levamisole	Cocaine base	TP
POS120-1	cocaine HCl (79.7%)	Cocaine HCl	TP
POS120-2	cocaine HCl (79.7%)	Cocaine HCl	TP
POS120-3	cocaine HCl (79.7%)	Cocaine HCl	TP
POS121-1	cocaine HCl (44.1%), cocaine, mannitol	Cocaine HCl	TP
POS121-2	cocaine HCl (44.1%), cocaine, mannitol	Cocaine HCl	TP
POS121-3	cocaine HCl (44.1%), cocaine, mannitol	Cocaine HCl	TP
POS122-1	cocaine HCl (46.4%), phenacetin, levamisole	Cocaine HCl	TP
POS122-2	cocaine HCl (46.4%), phenacetin, levamisole	Cocaine HCl	TP
POS122-3	cocaine HCl (46.4%), phenacetin, levamisole	Cocaine HCl	TP
POS123-1	cocaine HCl (77.9%)	Cocaine HCl	TP
POS123-2	cocaine HCl (77.9%)	Cocaine HCl	TP
POS123-3	cocaine HCl (77.9%)	Cocaine HCl	TP
POS124-1	cocaine HCl (80.8%), mannitol	Cocaine HCl	TP
POS124-2	cocaine HCl (80.8%), mannitol	Cocaine HCl	TP
POS124-3	cocaine HCl (80.8%), mannitol	Cocaine HCl	TP
POS125-1	cocaine HCl (76.8%)	Cocaine HCl	TP
POS125-2	cocaine HCl (76.8%)	Cocaine HCl	TP
POS125-3	cocaine HCl (76.8%)	Cocaine HCl	TP

Note. Cocaine percentages are given in wt% of cocaine base.

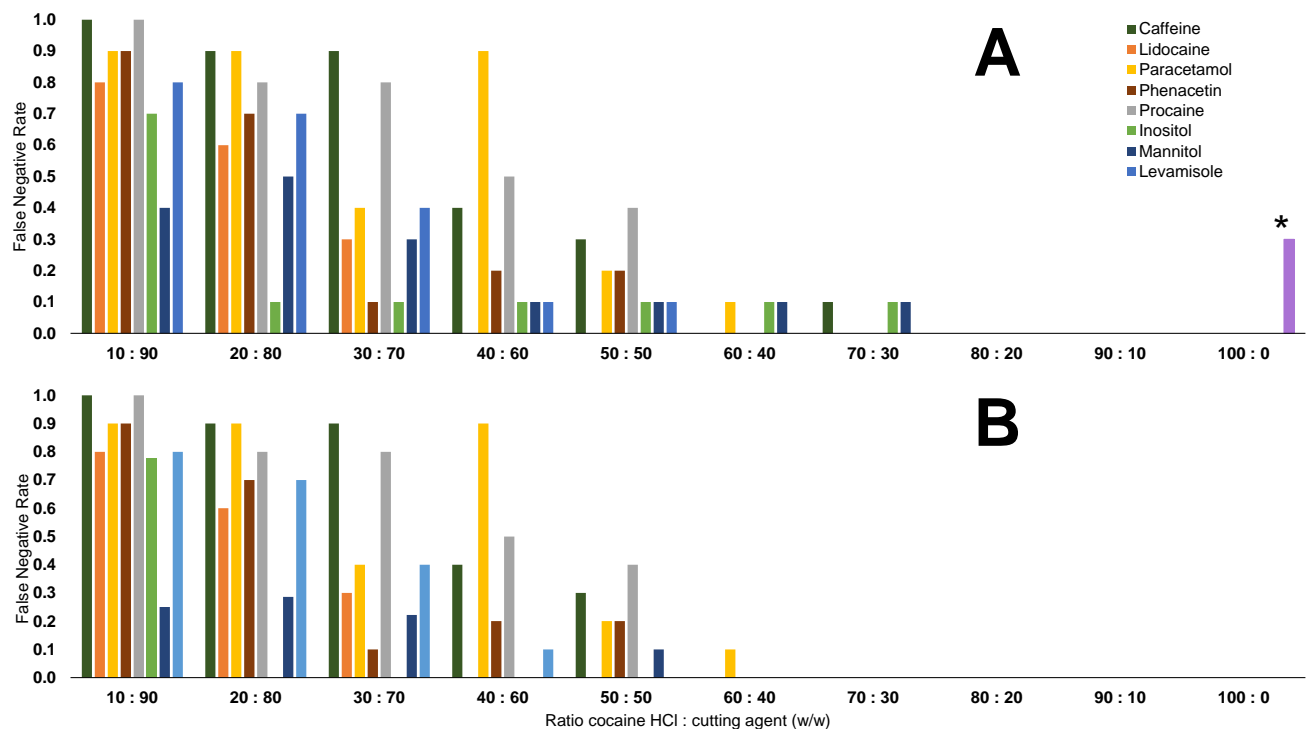


Figure S1. False-negative results of the TruNarc handheld Raman spectrometer for binary cocaine mixtures with 8 common cutting-agents at concentrations ranging from 10 – 100 wt% cocaine. 10-fold replicate scans per sample; no special instructions for analyzing. False-negative rates with (A) and without (B) inconclusive scan results. (*) indicates inconclusive results for pure cocaine (3 out of 80 scans).

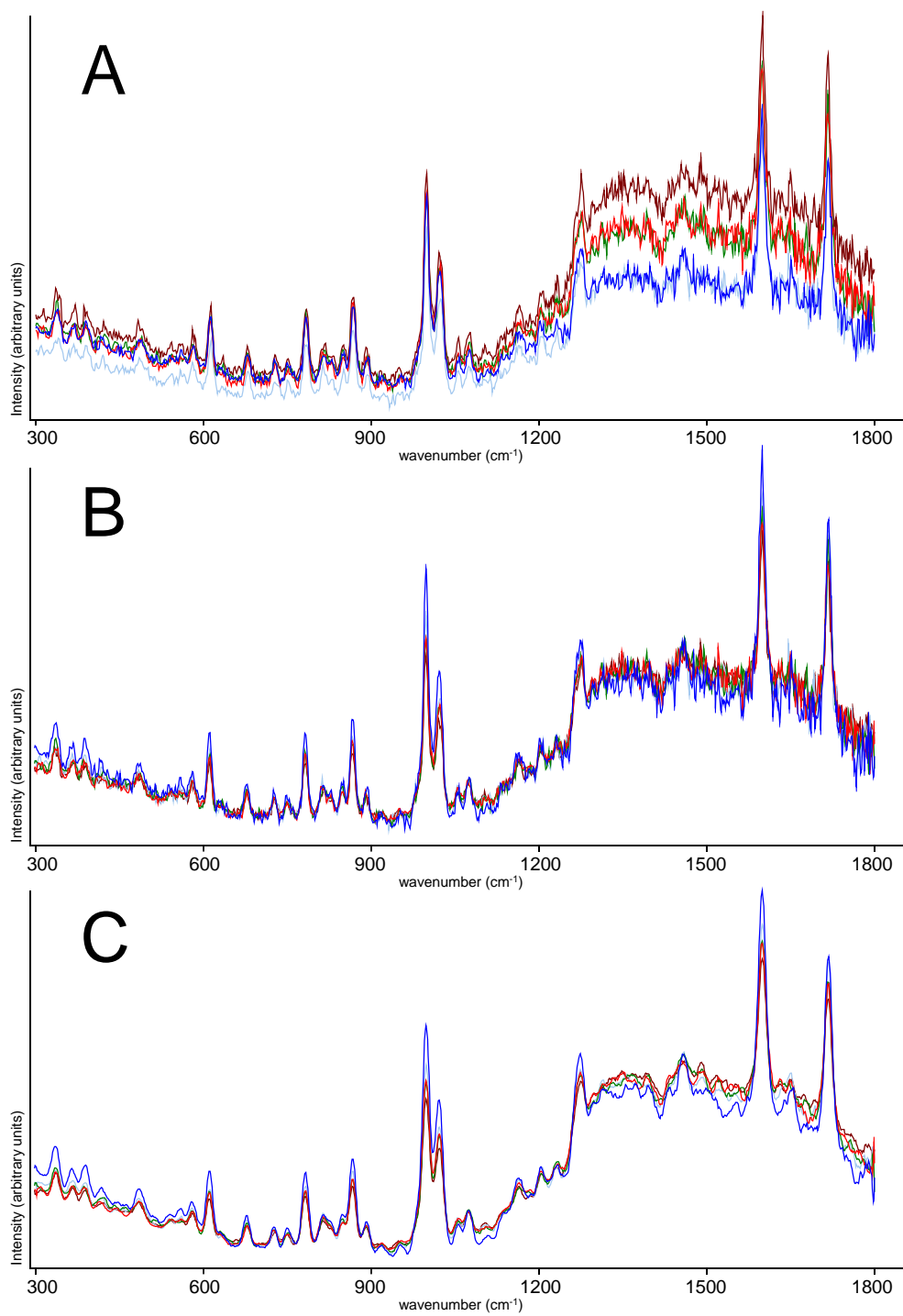


Figure S2. Raman spectra of 5 replicate scans of a single cocaine HCl sample. Raw spectral data (A), spectral data after SNV preprocessing (B) and SNV with subsequent 9 datapoint SG smoothing (C).

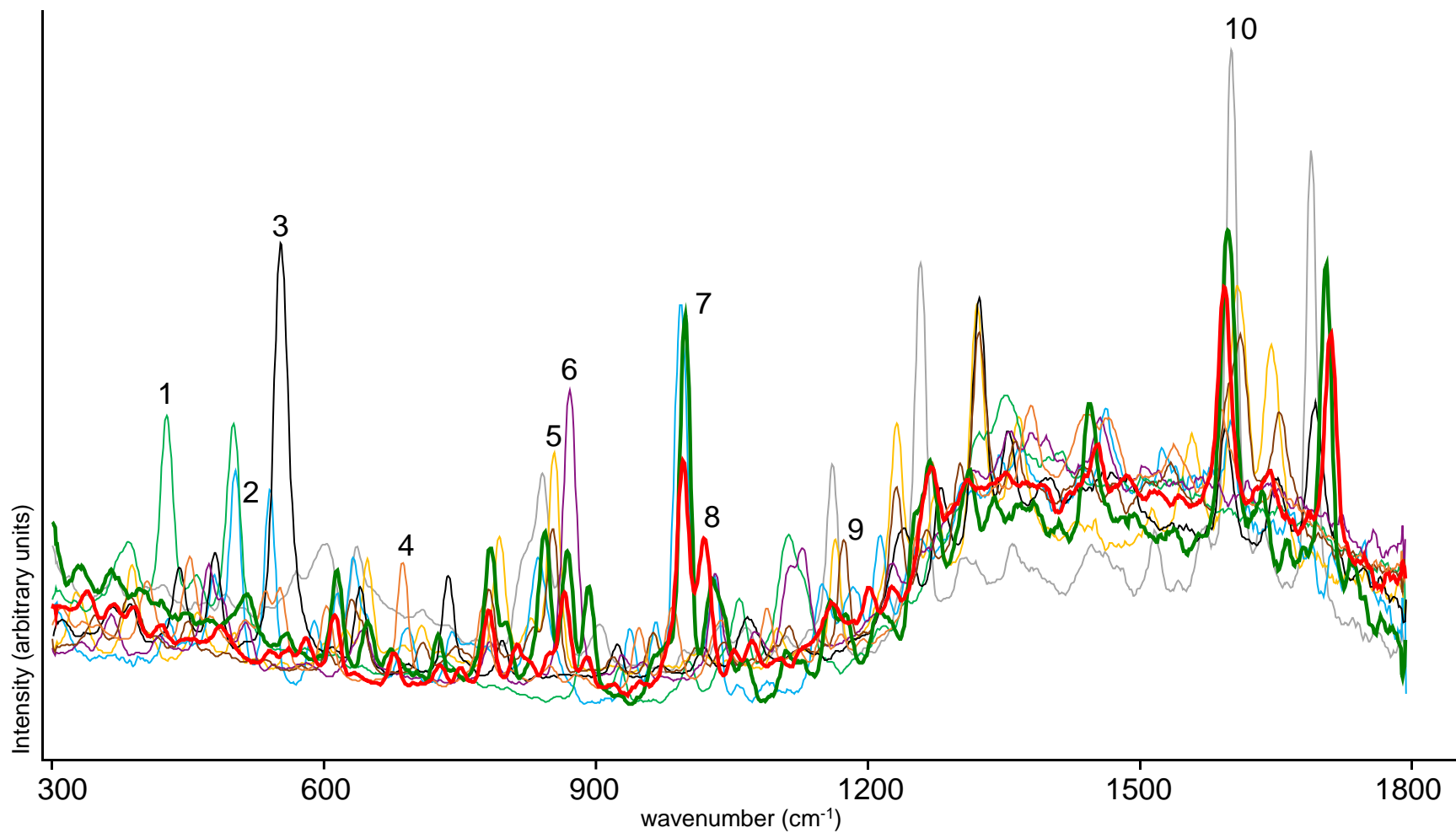


Figure S3. Raman spectra of cocaine and common cutting agents. Inositol (1, light green); levamisole (2, blue); caffeine (3, black); lidocaine (4, orange); paracetamol (5, yellow); mannitol (6, purple), cocaine base (7, green); cocaine HCl (8, red); phenacetine (9, brown); procaine (10, grey). All spectra were pre-processed by SNV and 9 datapoint SG smoothing.