

SUPPLEMENTAL MATERIAL

Chemometric Evaluation of Ultraviolet–Visible (UV–Vis) Spectra for Characterization of Silver Nanowire Diameter and Yield

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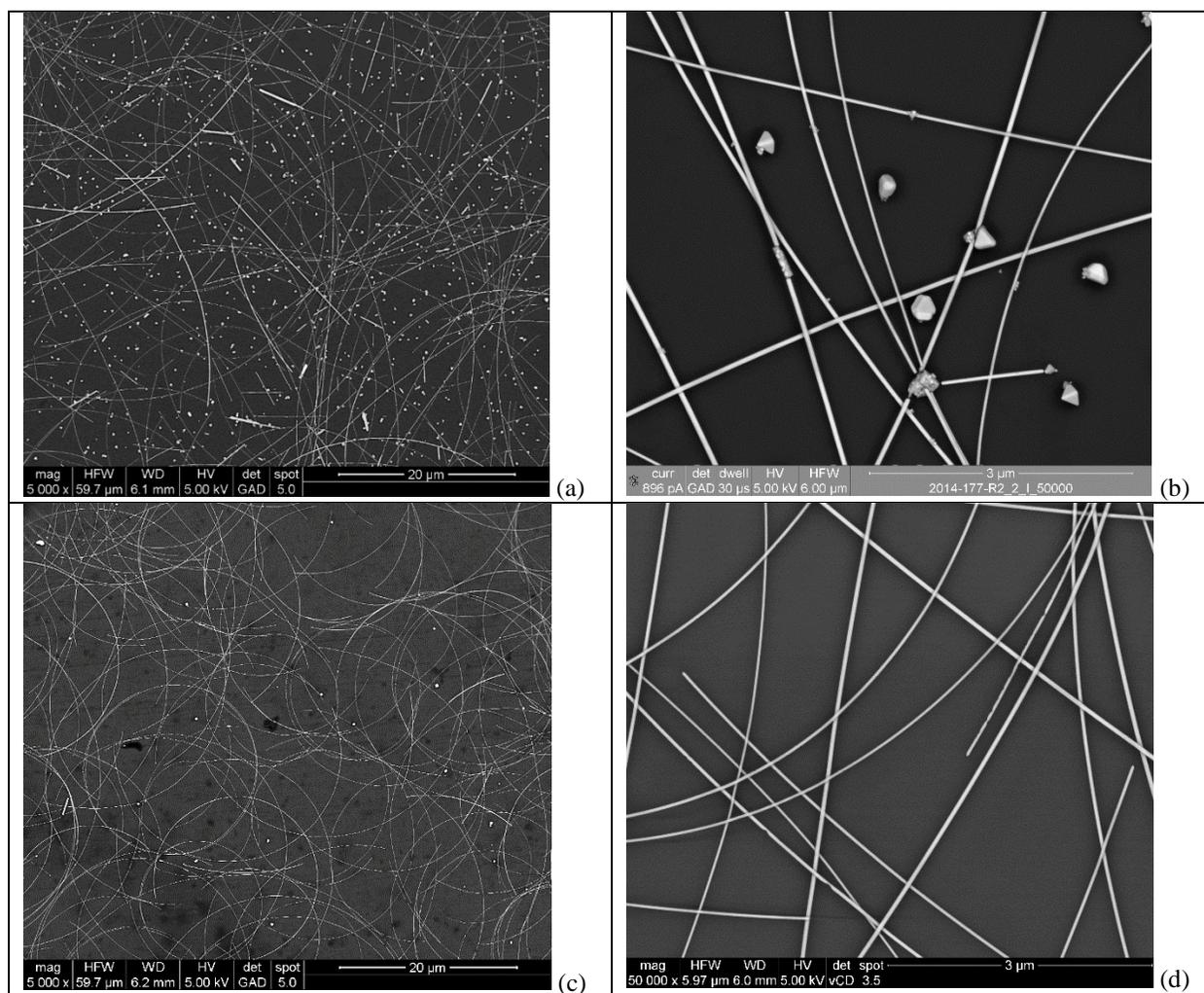


Figure S1. Scanning Electron Microscope images of four different AgNW samples. (a) and (b) are reactor products. (c) and (d) are reactor products after cross-flow filtration to remove particles.

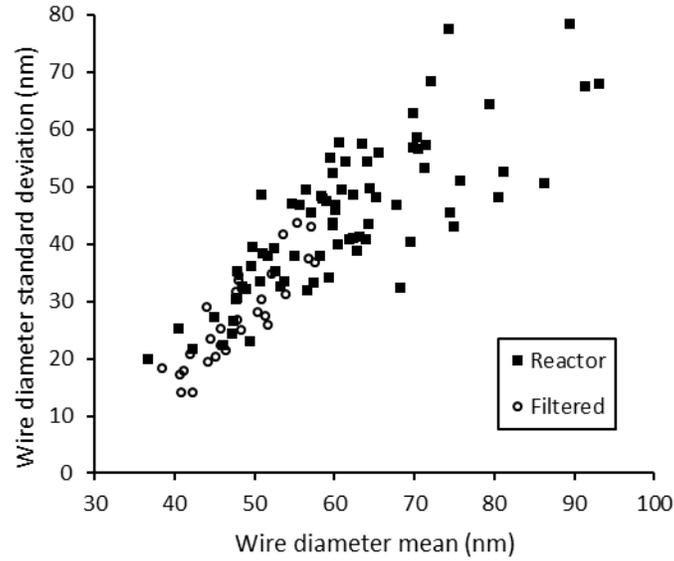


Figure S2. Absolute wire diameter standard deviation in nm as a function of average wire diameter for data set used in this report.

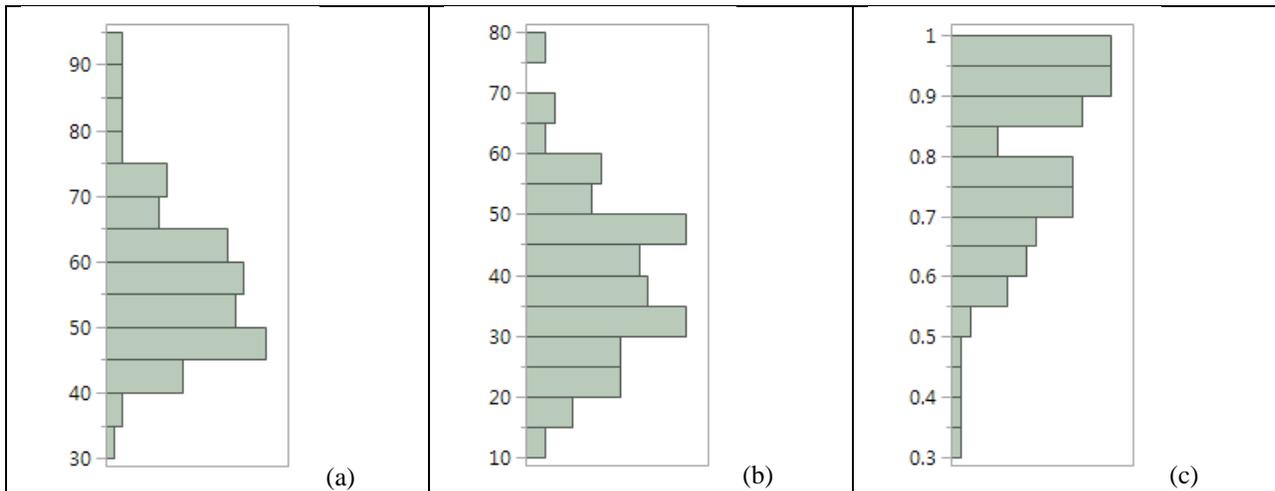


Figure S3. Distribution of (a) mean wire diameter in nm, (b) diameter standard deviation in nm, and (c) wire yield for the data set used in this report. The horizontal axes are 'count'.

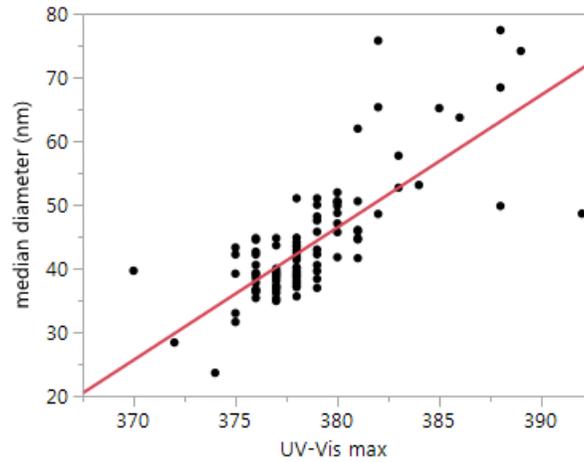


Figure S4. Wire diameter median as a function of maximum UV-Vis absorption peak position.

$$\text{Wire diameter median (nm)} = -743.9 + 2.080 * UVVisMax$$

Table S1. Fit statistics for wire diameter mean as a function of UV-Vis absorption peak position.

Linear Fit				
Wire diameter mean (nm) = -999.6168 + 2.7912316*UV-Vis max				
Summary of Fit				
RSquare		0.547929		
RSquare Adj		0.543664		
Root Mean Square Error		8.14624		
Mean of Response		57.30377		
Observations (or Sum Wgts)		108		
Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	8525.850	8525.85	128.4764
Error	106	7034.289	66.36	Prob > F
C. Total	107	15560.140		<.0001*
Parameter Estimates				
Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-999.6168	93.24939	-10.72	<.0001*
UV-Vis max	2.7912316	0.246255	11.33	<.0001*

Table S2. Fit statistics for wire diameter median as a function of UV-Vis absorption peak position.

Linear Fit				
median diameter (nm) = -743.8626 + 2.0798022*UV-Vis max				
Summary of Fit				
RSquare		0.558287		
RSquare Adj		0.55412		
Root Mean Square Error		5.94406		
Mean of Response		43.66994		
Observations (or Sum Wgts)		108		
Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4733.5832	4733.58	133.9750
Error	106	3745.1760	35.33	Prob > F
C. Total	107	8478.7592		<.0001*
Parameter Estimates				
Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-743.8626	68.04121	-10.93	<.0001*
UV-Vis max	2.0798022	0.179684	11.57	<.0001*

Table S3. Fit statistics for wire yield as a function of normalized UV-Vis absorbance at 500 nm.

Linear Fit				
Wire/(Part+Wire) area = 1.0215029 - 0.7134461*500 nm				
Summary of Fit				
RSquare		0.598654		
RSquare Adj		0.594868		
Root Mean Square Error		0.096202		
Mean of Response		0.791429		
Observations (or Sum Wgts)		108		
Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1.4632978	1.46330	158.1113
Error	106	0.9810151	0.00925	Prob > F
C. Total	107	2.4443129		<.0001*
Parameter Estimates				
Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	1.0215029	0.020506	49.82	<.0001*
500 nm	-0.713446	0.056739	-12.57	<.0001*

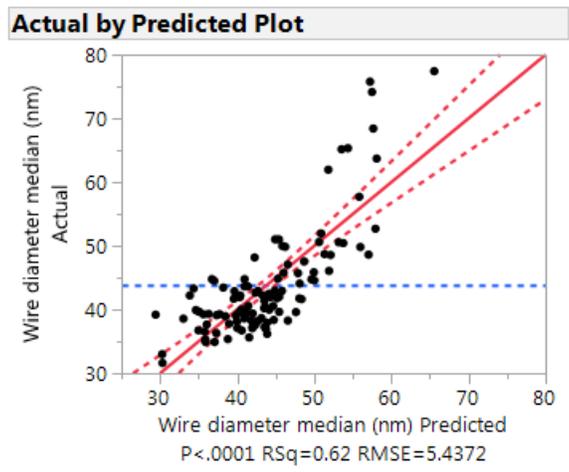


Figure S5. Wire diameter median as a function of Principal Component scores.

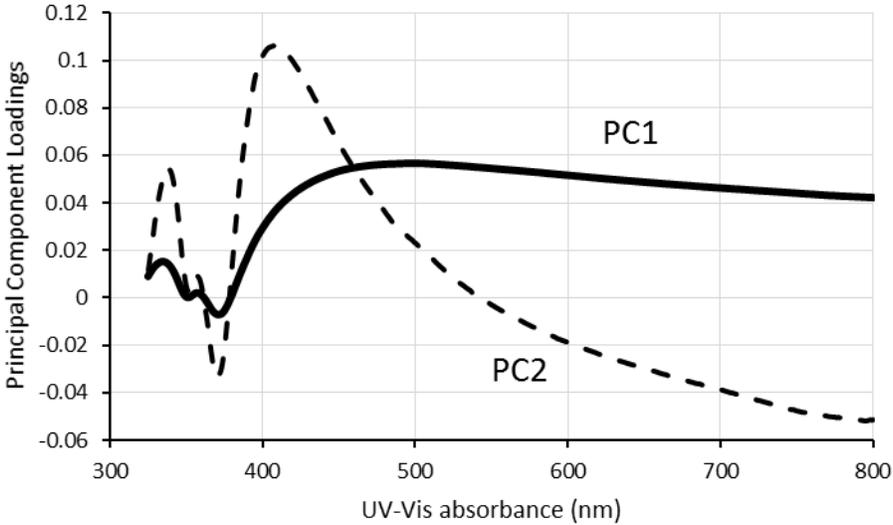


Figure S6. Principal Component Loadings.

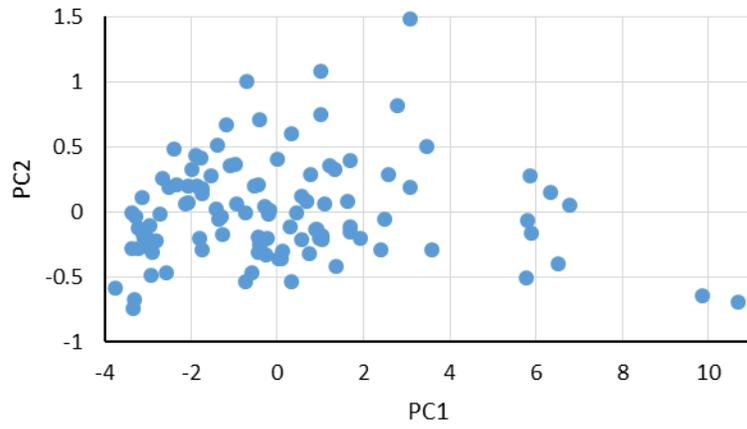


Figure S7. Principal Component Scores.