Electronic Supplementary Material (ESI) for Nanoscale

Single walled carbon nanotube growth and chirality dependence on catalyst composition

Alvin W. Orbaek, Andrew C. Owens, Christopher C. Crouse, Cary L. Pint, Robert H. Hauge, and Andrew R. Barron*

Department of Chemistry, Rice University, Houston, TX 77005, USA.

Department of Mechanical Engineering and Materials Science, Rice University, Houston, TX 77005, USA.

College of Engineering, Swansea University, Singleton Park, Swansea SA2 8PP, Wales, UK.

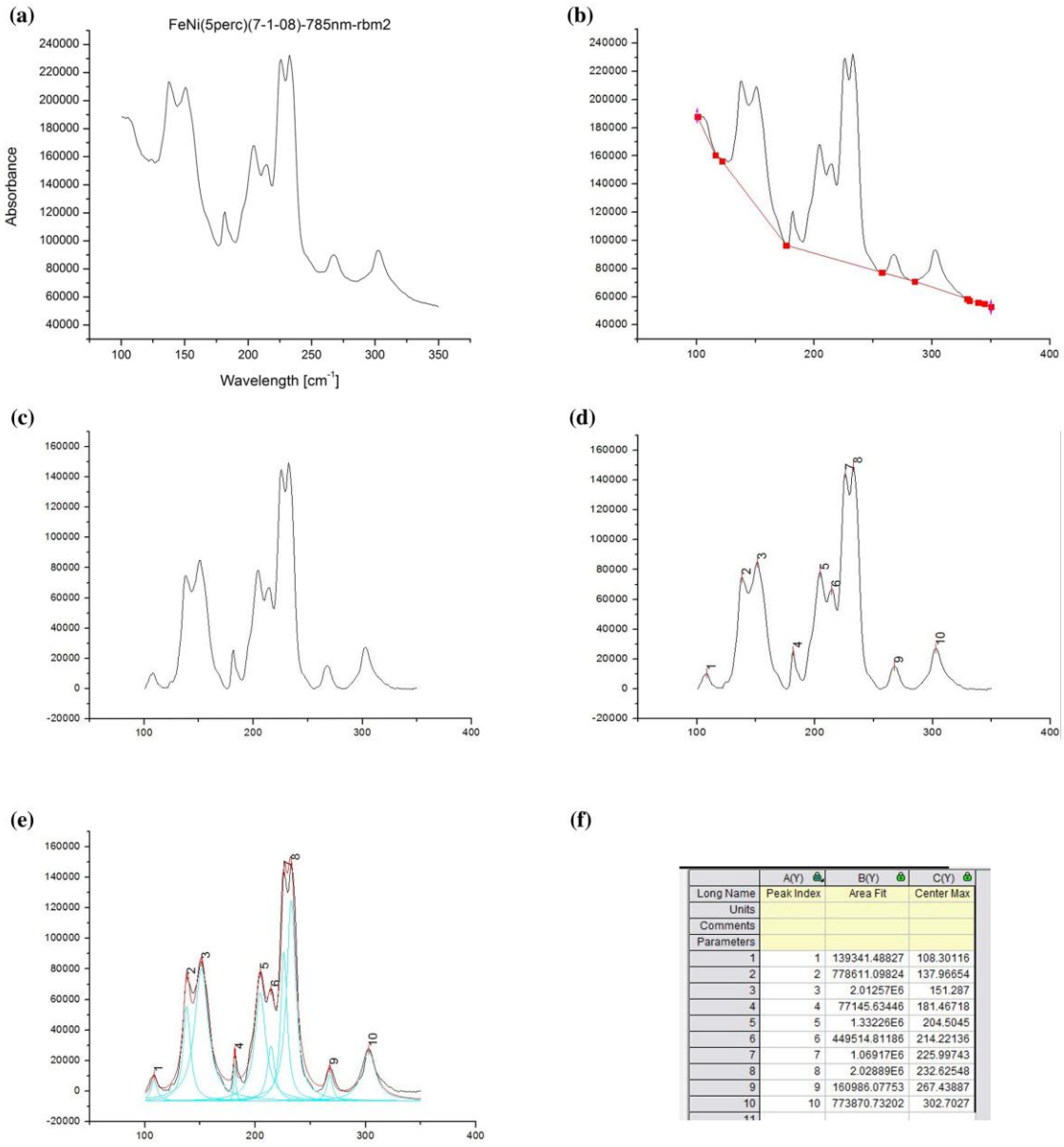
Supplementary information

Table S1. Experimental values used for the synthesis of iron oxide and bi-metallic oxide nanoparticles

Sample	$Fe(acac)_3$ (mmol)	$M(acac)_x$ (mmol)	1,2-HDD (mmol)	Oleic acid (mmol)	Oleyl amine (mmol)	% Fe ICP-AES
Fe_3O_4	0.75	0	1.5	3	3	100
l-Mn-Fe-O	0.5	0.25	1.5	3	3	91
h-Mn-Fe-O	0.225	0.525	1.5	3	3	63
l-Co-Fe-O	0.7125	0.0375	1.5	3	3	97
h-Co-Fe-O	0.5	0.25	1.5	3	3	67
l-Ni-Fe-O	0.7125	0.0375	1.5	3	3	94
h-Ni-Fe-O	0.5	0.25	1.5	3	3	69
l-Cu-Fe-O	0.5	0.25	1.5	3	3	98
h-Cu-Fe-O	0.45	0.3	1.5	3	3	76

Table S2. Number of independent growth runs for each catalyst composition.

	l-Mn-Fe	*h*-Mn-Fe	Fe_3O_4	*l*-Co-Fe	*h*-Co-Fe	*l*-Ni-Fe	*h*-Ni hi	*l*-Cu-Fe	*h*-Cu-Fe
514 nm	8	10	14	9	6	7	8	8	9
633 nm	5	6	7	5	6	7	7	7	7
785 nm	11	5	3	5	4	3	7	12	4



	A(Y)	B(Y)	C(Y)
Long Name	Peak Index	Area Fit	Center Max
Units			
Comments			
Parameters			
1	1	139341.48827	108.30116
2	2	778611.09824	137.96654
3	3	2.01257E6	151.287
4	4	77145.63446	181.46718
5	5	1.33226E6	204.5045
6	6	449514.81186	214.22136
7	7	1.06917E6	225.99743
8	8	2.02889E6	232.62548
9	9	160986.07753	267.43887
10	10	773870.73202	302.7027

Figure S1. Protocol used to fit Raman data starting with raw data (a) the baseline is first determined (b), and then subtracted (c). The peaks are then identified (d) and the area under the peaks obtained (e). The data is exported for further use (f) such that the peaks for each set of raw data is determined and the respective volume under each peak determined.

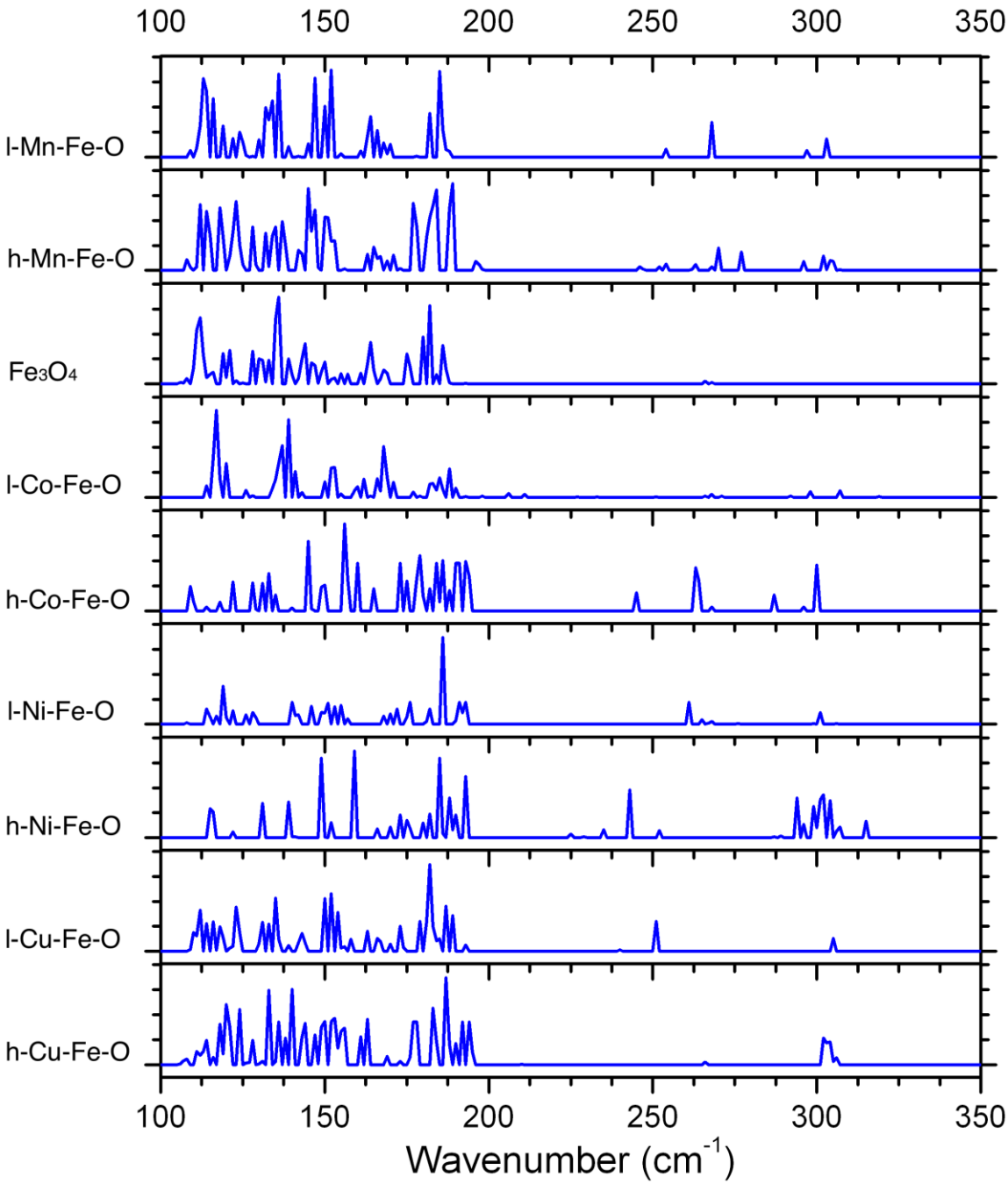


Figure S2. Collected and normalized Raman data for all growth runs acquired using the 514 nm laser line.

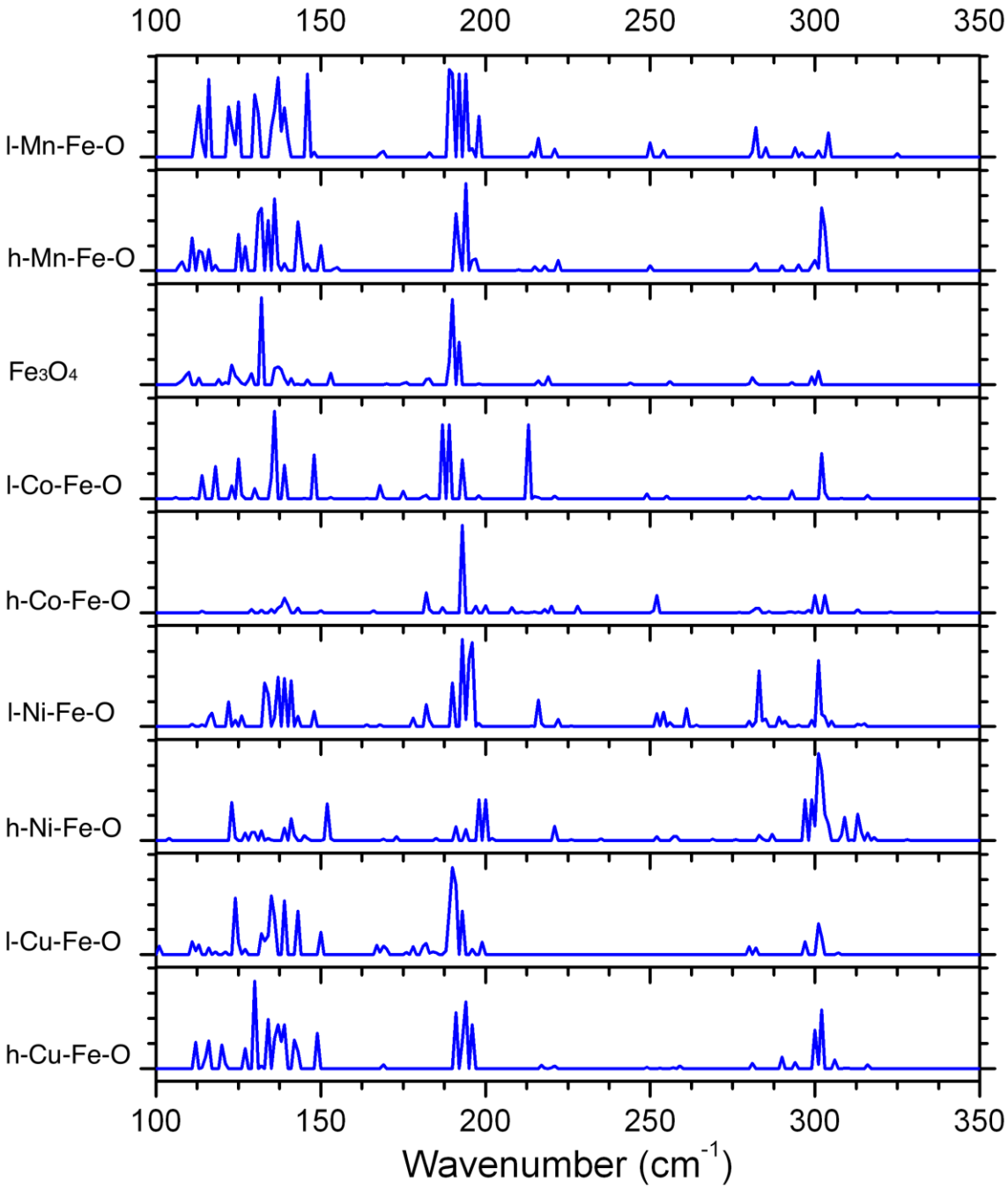


Figure S3. Collected and normalized Raman data for all growth runs acquired using the 633 nm laser line.

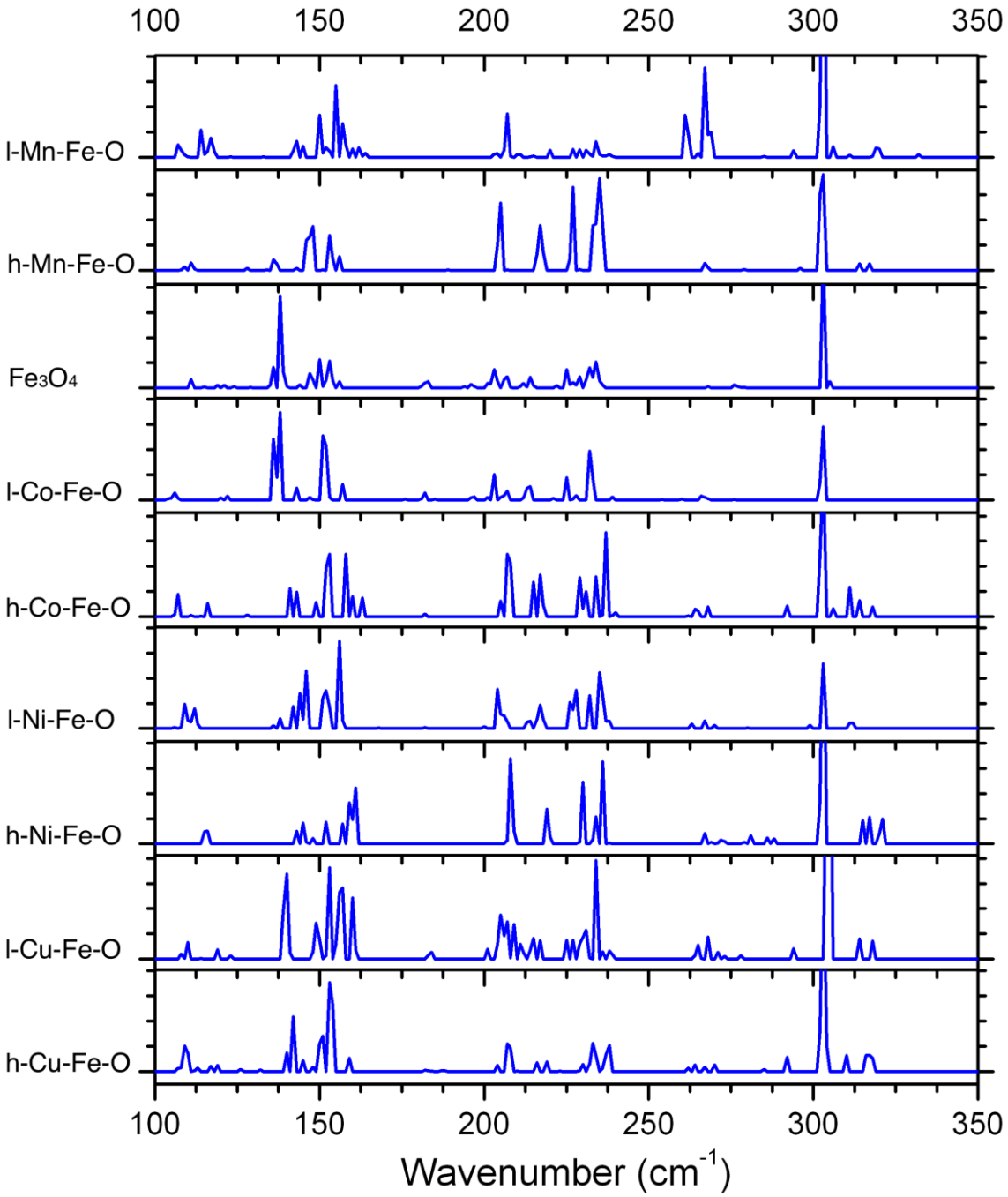


Figure S4. Collected and normalized Raman data for all growth runs acquired using the 785 nm laser line.

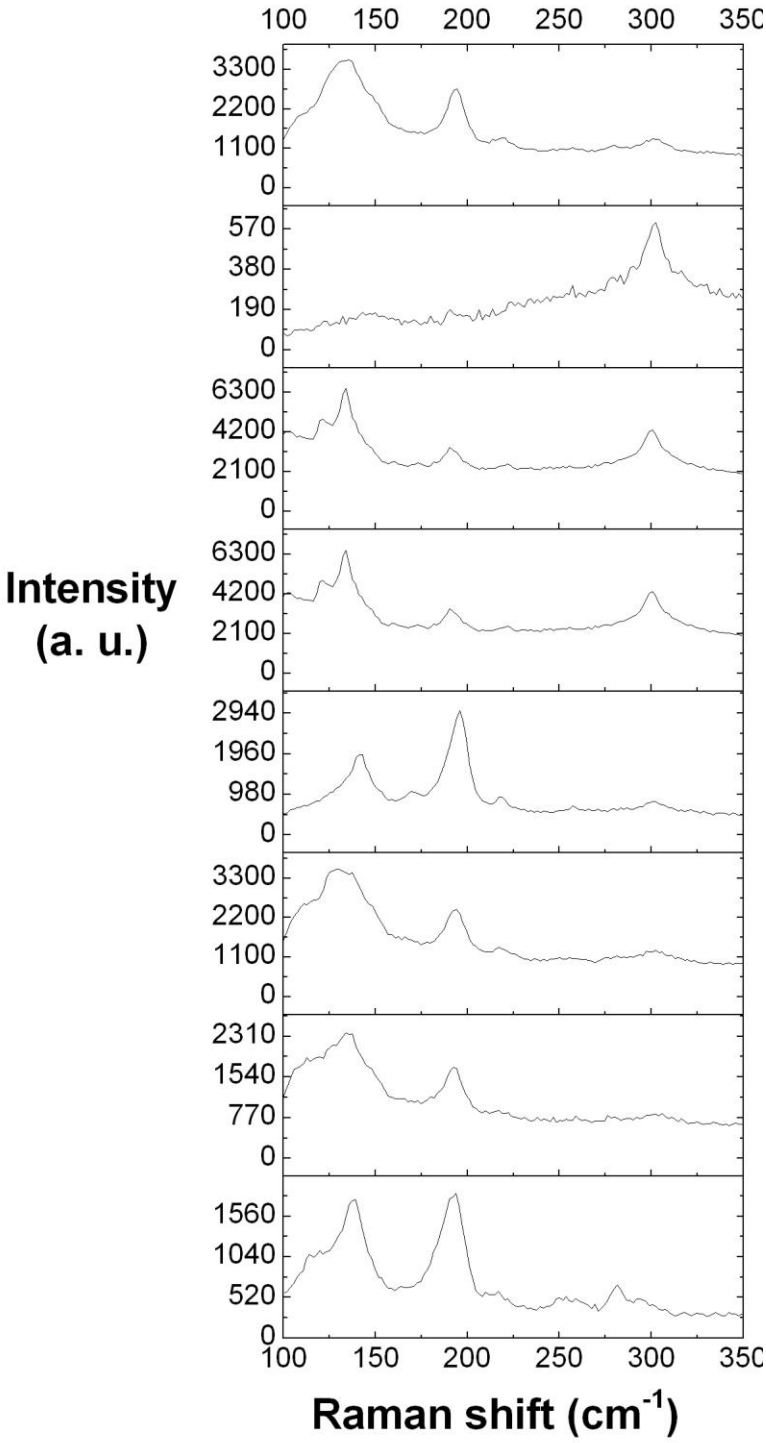


Figure S5. Collected h-Cu-Fe sample acquired using 633 nm laser wavelength.

Electronic Supplementary Material (ESI) for Nanoscale