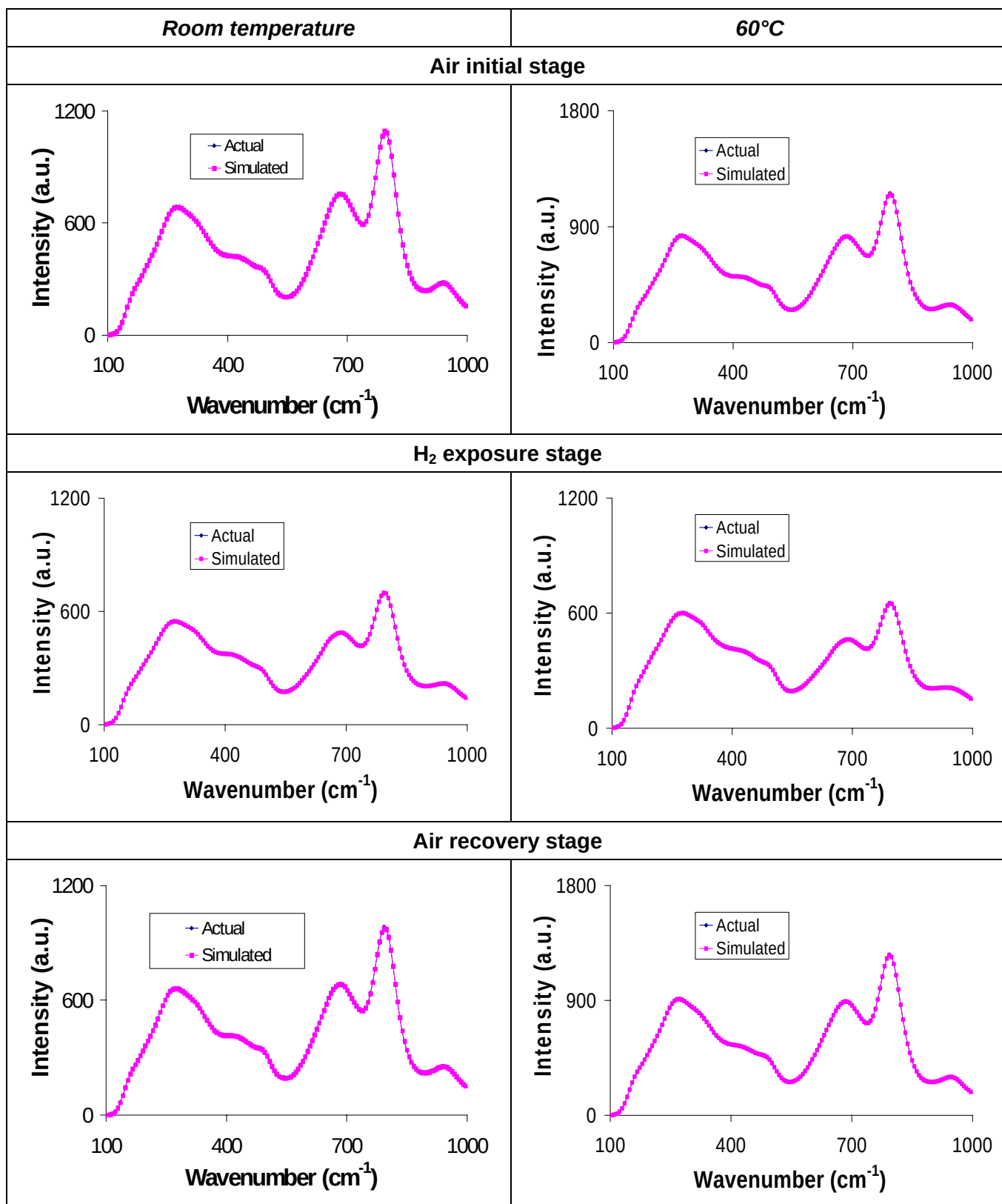
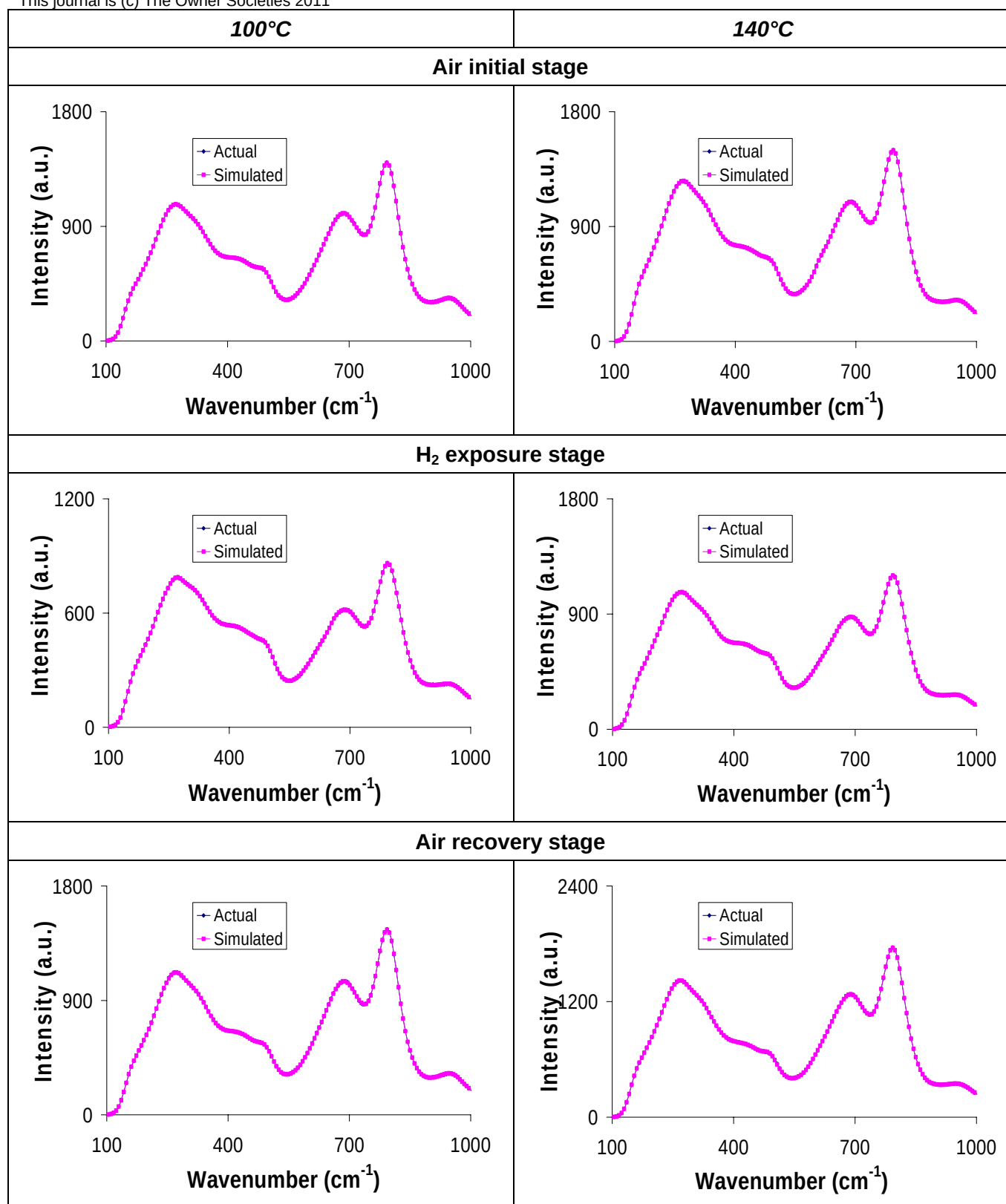


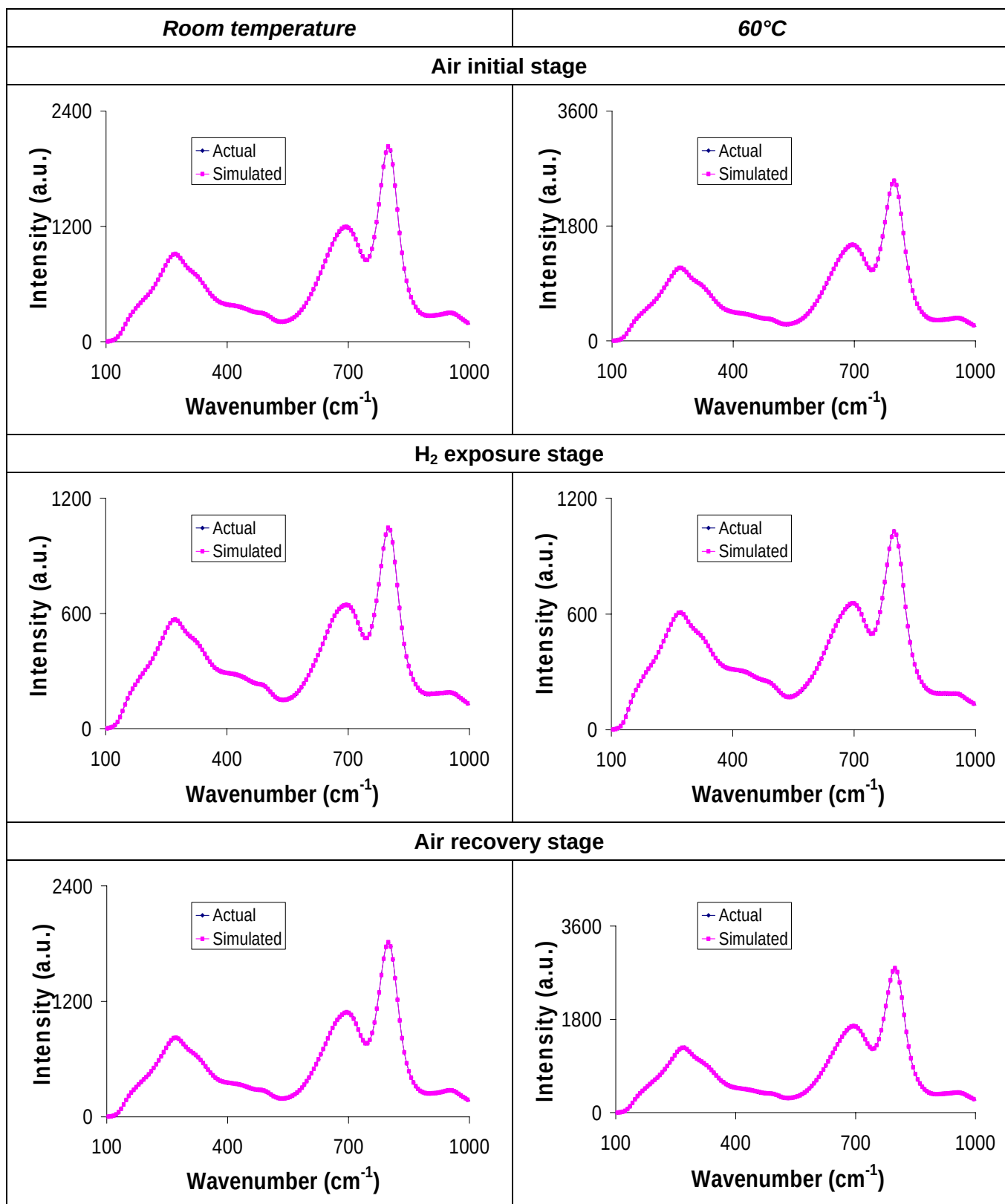
Supplementary Files: Comparison between actual and simulated Raman spectra

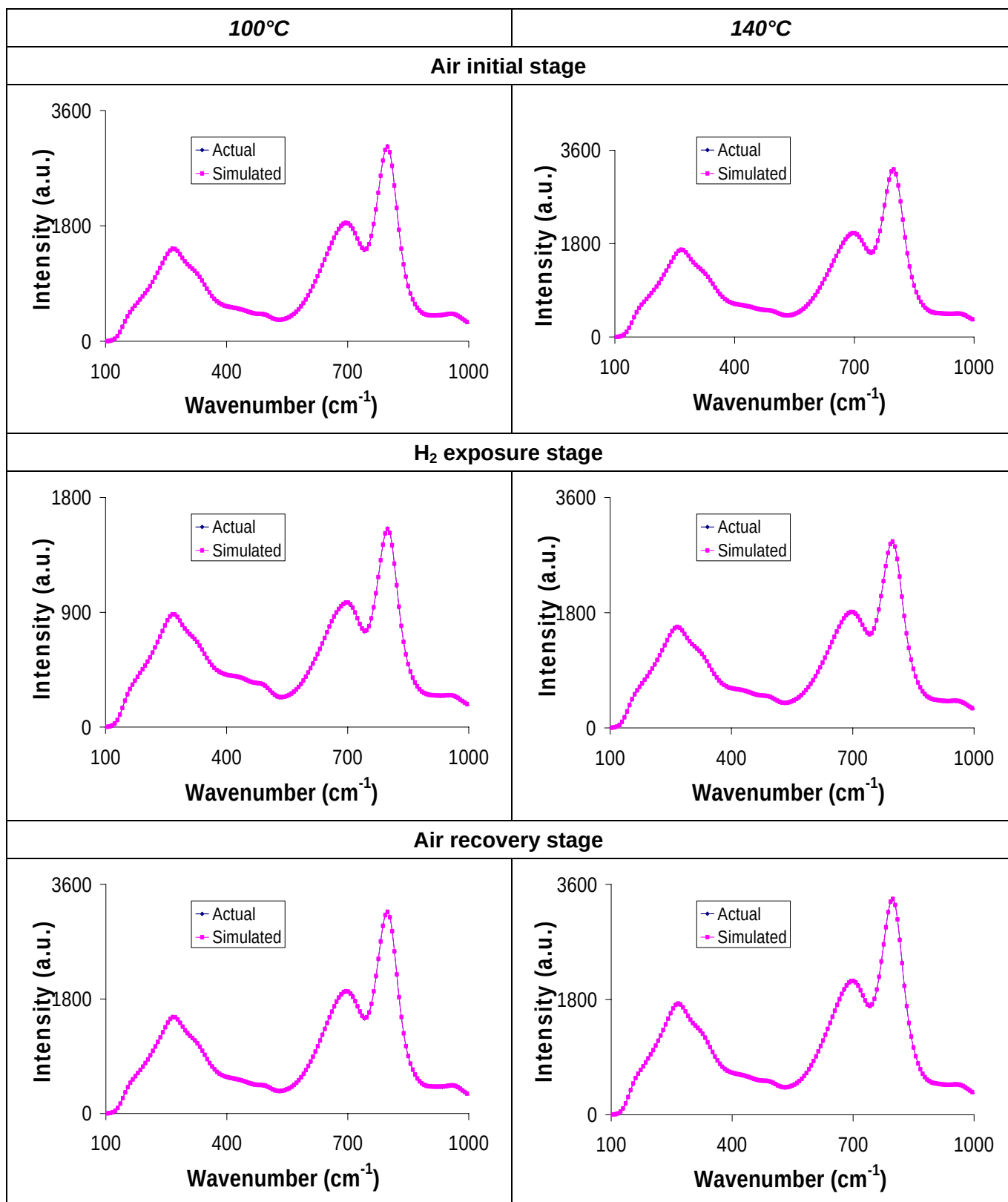
As-deposited sample:



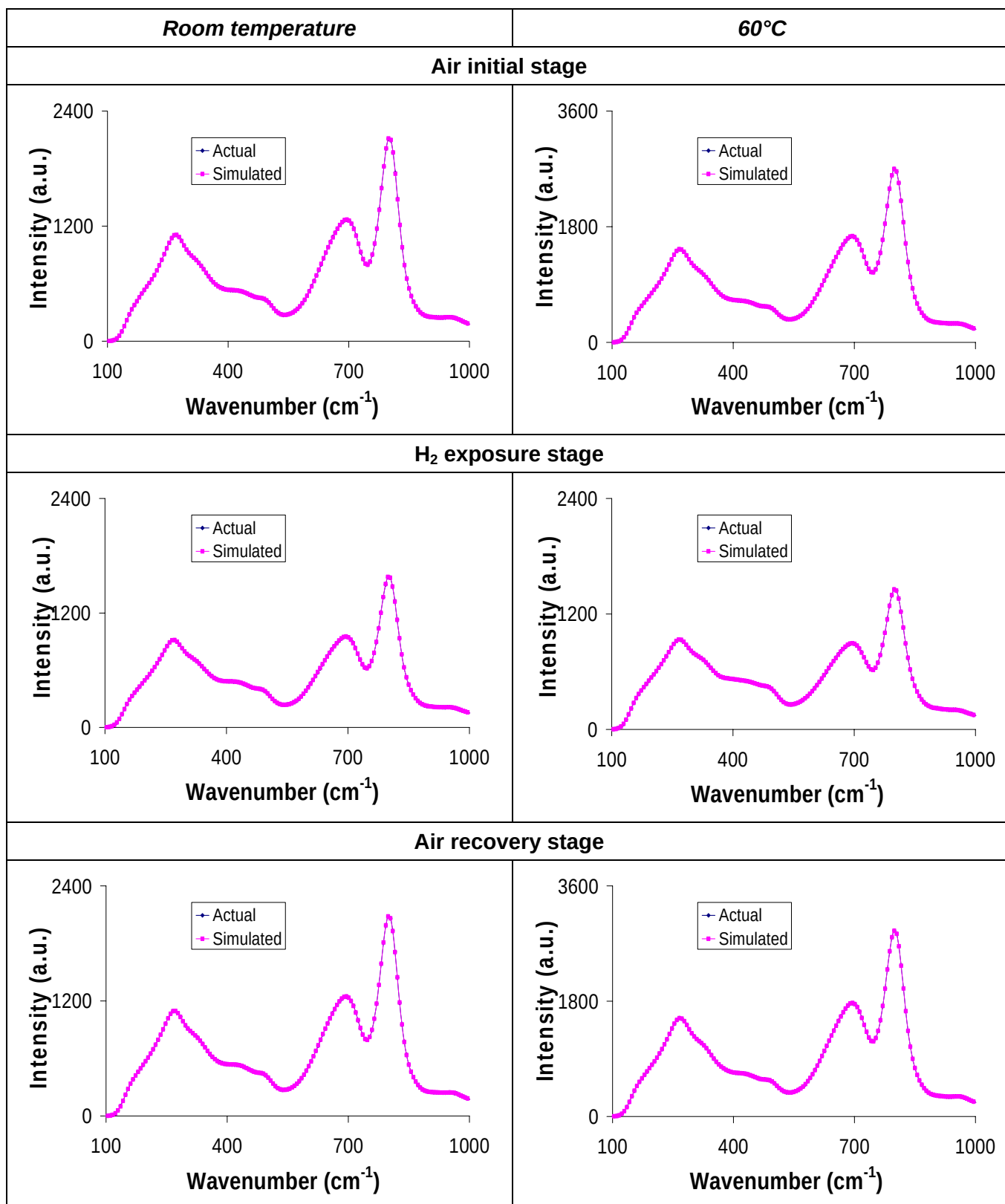


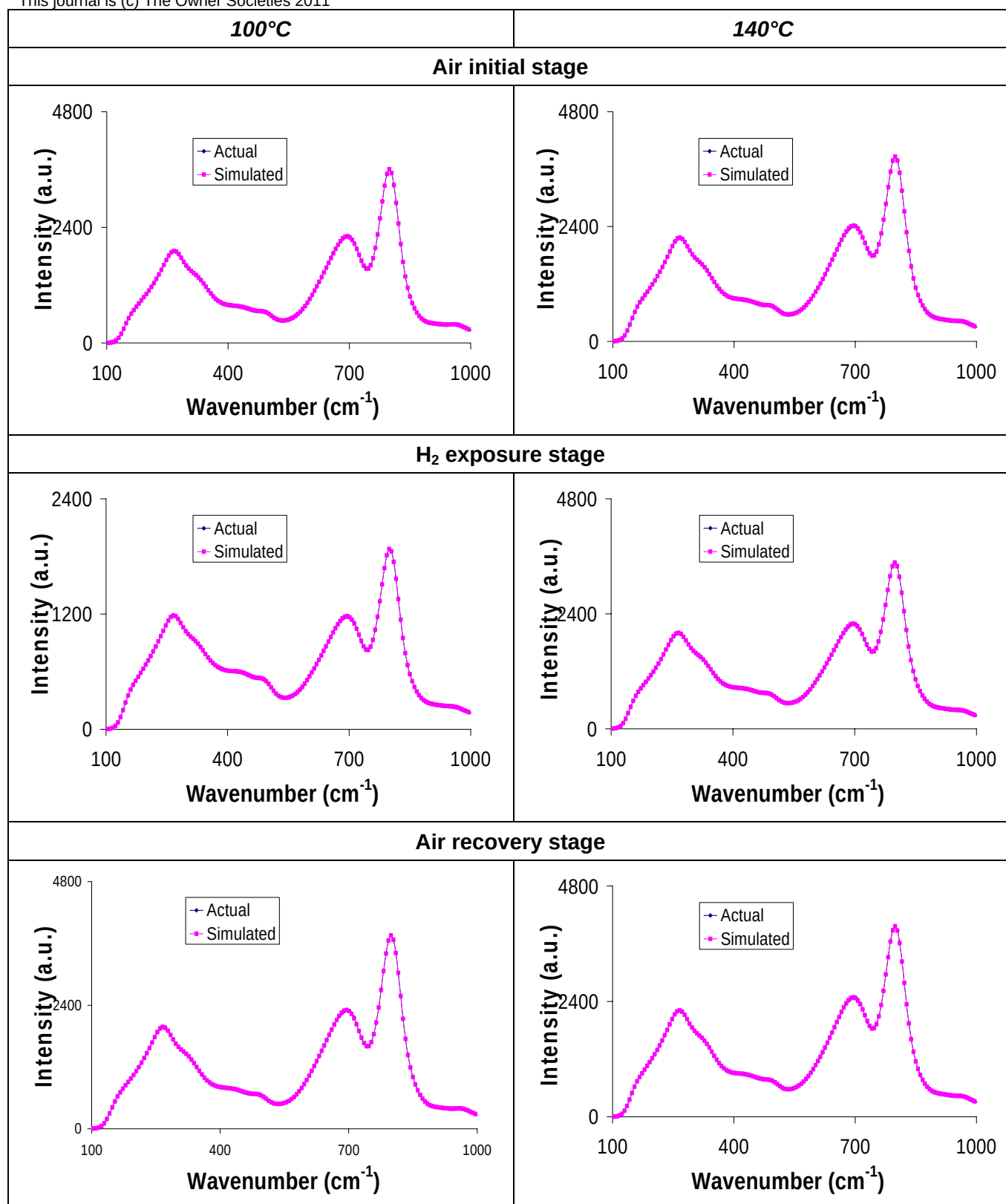
300°C annealed sample:



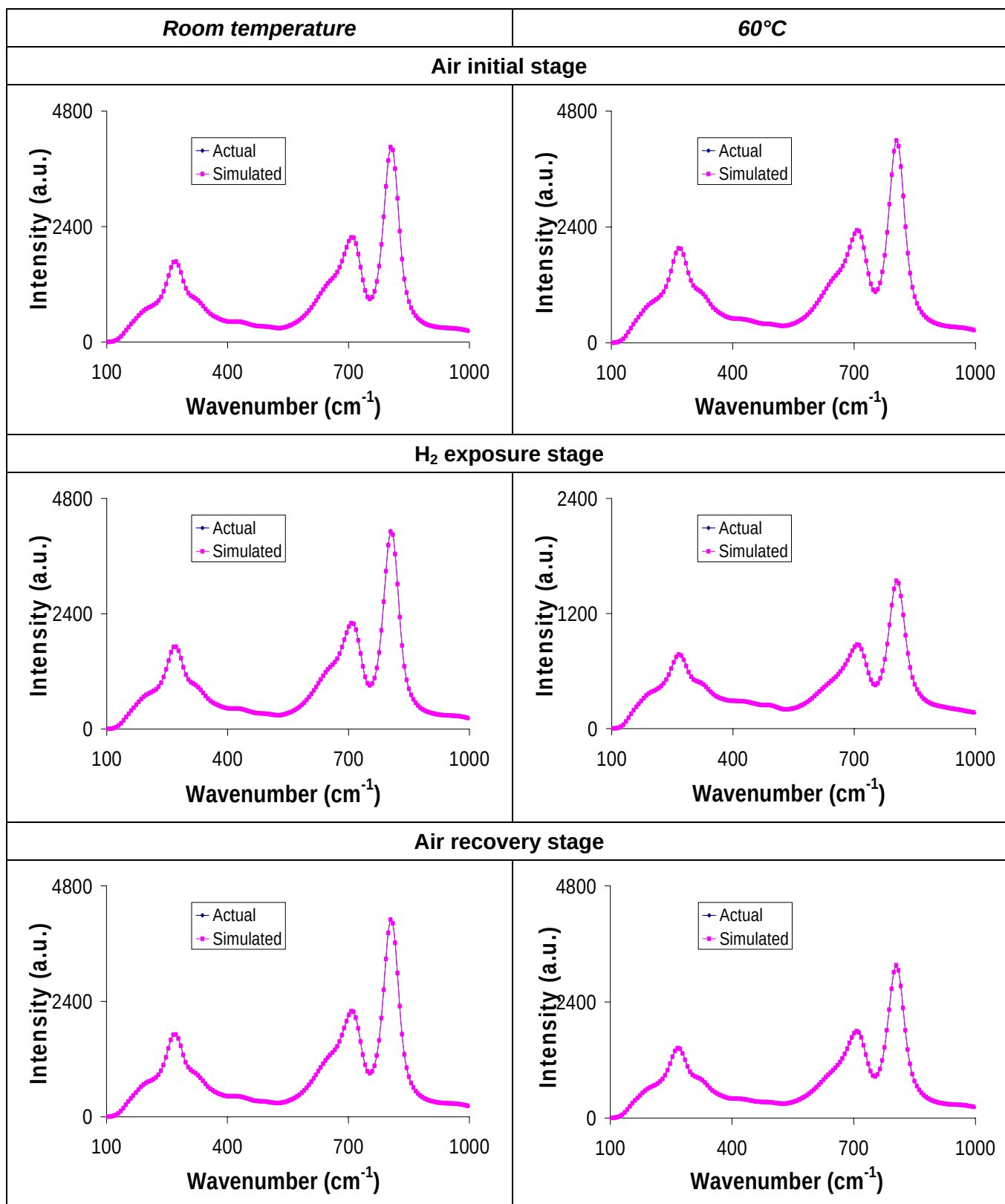


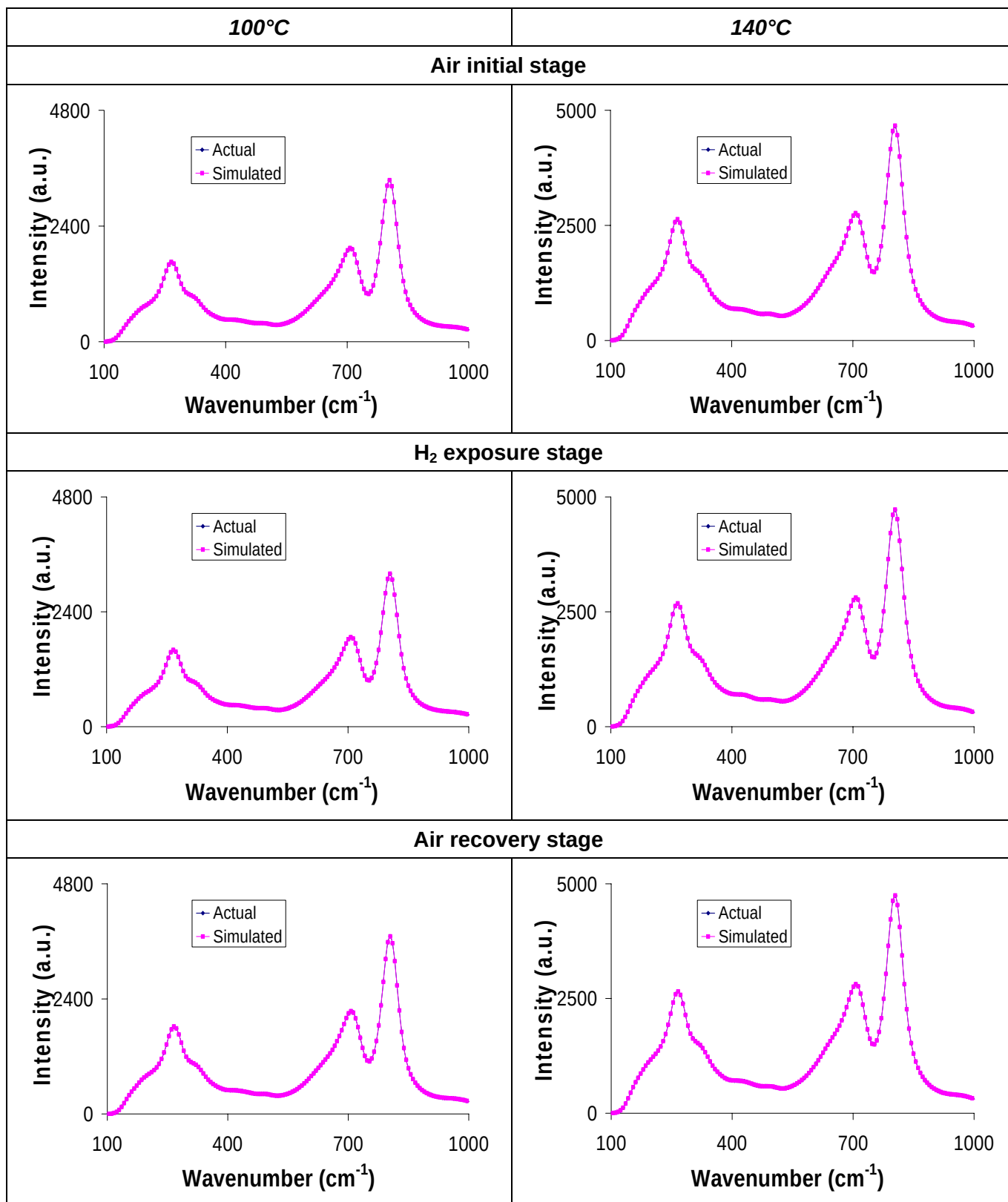
400°C annealed sample:





500°C annealed sample:

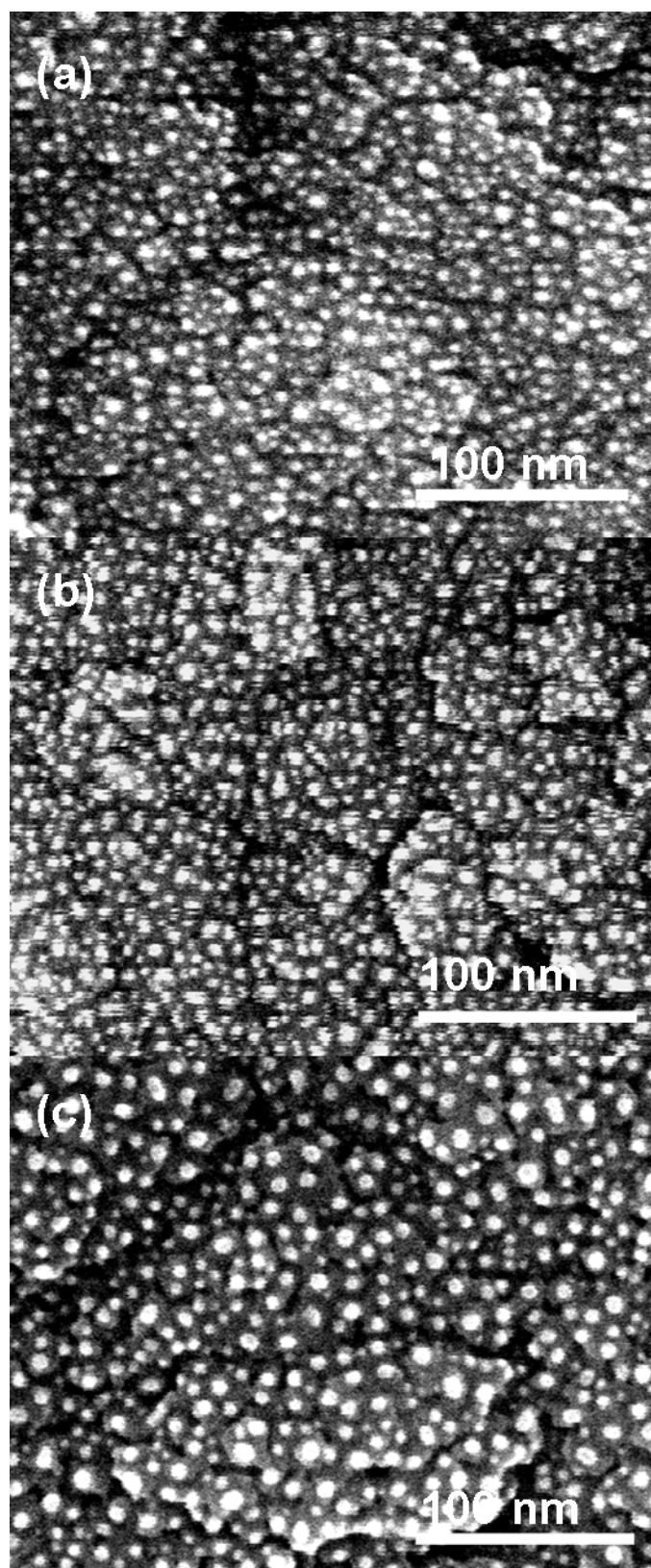




500C annealed sample-Simulation peaks summary

Air initial			H2 exposure			Air recovery		
Center Frequency	Intensity	FWHM	Center Frequency	Intensity	FWHM	Center Frequency	Intensity	FWHM
<u>Room Temperature</u>								
154.158	167.525	39.85	155.168	178.976	41.284	155.277	181.188	40.9051
188.407	429.475	52.13	189.709	451.764	52.699	190.19	466.745	52.7073
239.01	754.05	69.91	239.854	765.337	69.4313	241.609	766.412	69.424
270.308	976.358	40.7	270.061	989.774	40.5236	269.871	906.241	39.4741
316.799	851.619	72.05	316.439	859.247	72.7176	315.126	857.683	76.9979
372.359	151.139	46.7	373.315	123.151	44.1164	372.99	97.1633	41.8362
423.517	397.24	99.68	420.531	389.234	103.898	418.14	357.148	100.005
497.07	91.9945	50.53	496.291	69.6094	45.8465	495.274	56.0141	42.446
595	363.974	167	595.543	351.922	186.139	595	321.705	230.509
673.847	1112.83	103.3	673.786	1116.79	106.322	675.789	1119.89	112.81
686.585	99.0609	25.78	688.372	142.566	26.8709	687.482	111.536	25.4901
713.773	1276.21	43.15	713.862	1248.37	41.8247	713.569	1167.39	41.4163
800.245	1362.06	72.82	801.509	1380.11	76.3004	802.088	1465.84	69.0091
806.414	2399.58	35.83	805.446	2423.54	35.7433	805.905	2317.62	35.0976
844.665	401.542	122.8	844.621	357.441	137.615	844.398	384.026	115.472
970.592	253.617	130.5	970.894	207.737	102.609	971.276	249.048	126.904
<u>60°C</u>								
154.197	214.82	39.16	150.64	69.5345	33.5986	159.17	260.594	43.0044
187.01	497.702	50.45	187.274	301.641	57.9973	190.793	402.554	42.685
234.388	868.605	66.65	235.125	347.363	56.0294	226.946	592.229	50.0935
269.437	1292.33	43.04	268.119	490.277	42.7912	267.027	1196.81	45.5132
315.499	814.983	64.58	312.511	351.964	68.0615	316.406	697.139	65.174
369.316	70.1706	32.8	368.481	25.6489	39.6041	368.535	73.4673	35.1858
406.585	487.722	164.7	410.491	280.345	171.456	410	388.191	129.666
497.334	36.1698	31.34	495.357	31.1217	35.6719	492.984	75.2753	55.474
595	363	166	595	185.228	166	595	363	166
678.616	1277.61	116	657.944	331.959	102.607	663.473	773.645	101.656
691.781	228.463	31.77	691	228	55.8494	691	228	48.2783
714.858	1113.25	39.61	715.838	460.253	45.1648	714.401	1034.31	47.2189
800.548	1390.84	73.01	799.728	553.581	85.1384	797.321	1219.92	74.7594
805.717	2406.7	37.22	806.27	823.444	37.6162	805.587	1669.16	36.6754
844	481.969	121.2	844	146.2	172.117	844	398.207	118.881
970	287.513	135	970	155.64	251.45	970	250.052	137.149
<u>100°C</u>								
154.689	221.581	39.64	157.276	266.448	40.8494	153.859	222.177	38.5223
185.755	410.548	46.85	186.218	338.679	41.8914	185.12	448.95	48.558
233.291	778.868	66.96	228.193	746.784	61.8649	232.134	850.863	66.9834
267.785	1027.36	42.47	266.768	1151.43	44.5073	267.701	1148.09	42.6109
313.773	747.749	66.8	314.545	760.853	67.8442	313.833	774.78	65.5268
368.334	63.6966	36.37	371.097	77.9529	41.174	368.205	60.298	33.7712
409.744	443.148	161.4	414.401	432.257	154.215	406.547	481.27	178.016
496.99	45.8267	38.71	497.376	49.9424	40.2704	496.048	39.379	34.3337
595	363	166	595	363	166	595	363	166
673	874.537	114.8	672.94	818.958	114.814	673	976.65	117.921
676.755	156.944	38.03	676.606	148.885	39.3834	680.001	208.126	42.625
712.091	1124.44	46.77	711.975	1089.71	47.4415	712.658	1210.08	46.7669
797.827	1265.54	77.16	798.019	1239.66	77.331	798.14	1468.04	74.9008
804.812	1747.34	38.15	804.775	1625.92	38.0114	804.708	1860.96	37.568
844	445.377	121	844	428.428	122.602	844	495.931	117.596
970	277.395	139.8	970	276.361	144.974	970	295.021	136.511

<u>140°C</u>									
154.254	312.651	38.82	154.955	343.845	39.6331	154.147	319.15	38.5133	
184.54	619.036	48.51	186.296	741.797	47.9488	184.204	647.314	47.9211	
230.257	1248.88	64.8	225.483	1120.34	53.088	228.634	1235.32	62.8107	
266.58	1692.29	43.06	265.455	2196.17	46.238	266.321	1762.64	43.8209	
312.706	1196.95	68.58	312.148	1155.91	60.759	312.748	1199.4	70.3562	
368.897	88.2957	36.66	368.885	738.638	96.1401	368.425	65.4193	32.3576	
408.613	661.522	161.2	432.927	337.534	57.059	408.042	686.91	159.377	
496.257	66.5544	36.77	483.864	351.499	72.3222	497.46	71.2425	39.286	
595	580.63	166	595	660.166	166	595	580	166	
681.462	84.857	33.78	682.615	97.9391	28.6008	683	1516.15	118.394	
683.394	1500.39	117.7	682.772	1480.98	112.788	683	117.181	33.6243	
711.855	1241.23	45.07	712.092	1306.8	44.7396	712.033	1272.1	44.286	
799.919	1862.35	72.99	798.979	1914.43	74.5199	799.806	1901.49	72.9594	
803.993	2217.69	38.54	804.059	2248.99	38.4424	803.979	2257.05	38.2752	
844	698.735	119.4	844	704.926	119.903	844	707.703	117.468	
970	354.092	125.4	970	356.538	125.761	970	356.332	126.773	



Supplementary Fig 1. High resolution SEM of (a) as-deposited sample, (b) 300°C annealed sample and (c) 400°C annealed sample.