

Supplementary Data

Table S1: Percentage difference in current density with respect to the total electroactive surface area (j) compared to surface coverage for arrays of hemispherical particles.

Coverage		900mV		850mV		800mV		750mV		700mV	
%	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	
10.0	-0.29976	0.00	-0.78542	0.00	-2.02358	0.00	-4.99333	0.00	-11.08391	0.00	
12.5	-0.29930	0.15	-0.78216	0.41	-2.00183	1.08	-4.85727	2.72	-10.36664	6.47	
15.0	-0.29881	0.32	-0.77893	0.83	-1.98045	2.13	-4.72651	5.34	-9.71561	12.34	
17.5	-0.29836	0.47	-0.77574	1.23	-1.95937	3.17	-4.60078	7.86	-9.12339	17.69	
20.0	-0.29788	0.63	-0.77258	1.63	-1.93862	4.20	-4.47984	10.28	-8.58326	22.56	
22.5	-0.29743	0.78	-0.76939	2.04	-1.91820	5.21	-4.36347	12.61	-8.08968	27.01	
25.0	-0.29697	0.93	-0.76626	2.44	-1.89804	6.20	-4.25144	14.86	-7.63752	31.09	
27.5	-0.29648	1.09	-0.76310	2.84	-1.87821	7.18	-4.14357	17.02	-7.22267	34.84	
30.0	-0.29604	1.24	-0.76001	3.24	-1.85869	8.15	-4.03960	19.10	-6.84119	38.28	
32.5	-0.29555	1.41	-0.75692	3.63	-1.83947	9.10	-3.93949	21.10	-6.48967	41.45	
35.0	-0.29515	1.54	-0.75388	4.02	-1.82052	10.03	-3.84295	23.04	-6.16515	44.38	
37.5	-0.29466	1.70	-0.75078	4.41	-1.80183	10.96	-3.74981	24.90	-5.86510	47.08	
40.0	-0.29421	1.85	-0.74777	4.79	-1.78340	11.87	-3.66005	26.70	-5.58718	49.59	
42.2	-0.29373	2.01	-0.74473	5.18	-1.76529	12.76	-3.57337	28.44	-5.32926	51.92	
45.0	-0.29328	2.16	-0.74173	5.56	-1.74738	13.65	-3.48973	30.11	-5.08961	54.08	
47.5	-0.29281	2.32	-0.73877	5.94	-1.72978	14.52	-3.40895	31.73	-4.86649	56.09	
50.0	-0.29235	2.47	-0.73577	6.32	-1.71243	15.38	-3.33094	33.29	-4.65846	57.97	
52.5	-0.29191	2.62	-0.73282	6.70	-1.69539	16.22	-3.25549	34.80	-4.46429	59.72	
55.0	-0.29146	2.77	-0.72990	7.07	-1.67852	17.05	-3.18269	36.26	-4.28272	61.36	
57.5	-0.29101	2.92	-0.72699	7.44	-1.66190	17.87	-3.11224	37.67	-4.11275	62.89	
60.0	-0.29057	3.07	-0.72409	7.81	-1.64553	18.68	-3.04408	39.04	-3.95335	64.33	
62.5	-0.29010	3.22	-0.72123	8.17	-1.62940	19.48	-2.97817	40.36	-3.80377	65.68	
65.0	-0.28967	3.37	-0.71837	8.54	-1.61351	20.26	-2.91439	41.63	-3.66312	66.95	
67.5	-0.28921	3.52	-0.71549	8.90	-1.59781	21.04	-2.85261	42.87	-3.53078	68.15	
70.0	-0.28874	3.68	-0.71264	9.27	-1.58234	21.80	-2.79284	44.07	-3.40609	69.27	

Table S2: Percentage difference in current density with respect to the total electroactive surface area (j) compared to surface coverage for arrays of spherical particles.

Coverage	900mV		850mV		800mV		750mV		700mV	
	%	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)
10.0	-0.29791	0.00	-0.77273	0.00	-1.93964	0.00	-4.48506	0.00	-8.60215	0.00
12.5	-0.29699	0.31	-0.76647	0.81	-1.89928	2.08	-4.25739	5.08	-7.65686	10.99
15.0	-0.29607	0.62	-0.76027	1.61	-1.86011	4.10	-4.04613	9.79	-6.86033	20.25
17.5	-0.29515	0.92	-0.75415	2.40	-1.82209	6.06	-3.84988	14.16	-6.18399	28.11
20.0	-0.29425	1.23	-0.74809	3.19	-1.78518	7.96	-3.66730	18.23	-5.60550	34.84
22.5	-0.29334	1.53	-0.74211	3.96	-1.74933	9.81	-3.49723	22.02	-5.10736	40.63
25.0	-0.29243	1.84	-0.73619	4.73	-1.71449	11.61	-3.33861	25.56	-4.67563	45.65
27.5	-0.29154	2.14	-0.73034	5.49	-1.68067	13.35	-3.19050	28.86	-4.29926	50.02
30.0	-0.29064	2.44	-0.72456	6.23	-1.64780	15.05	-3.05201	31.95	-3.96926	53.86
32.5	-0.28975	2.74	-0.71884	6.97	-1.61585	16.69	-2.92237	34.84	-3.67839	57.24
35.0	-0.28886	3.04	-0.71317	7.71	-1.58478	18.29	-2.80089	37.55	-3.42075	60.23
37.5	-0.28797	3.34	-0.70758	8.43	-1.55459	19.85	-2.68692	40.09	-3.19148	62.90
40.0	-0.28709	3.63	-0.70205	9.15	-1.52522	21.37	-2.57986	42.48	-2.98654	65.28
42.2	-0.28622	3.92	-0.69657	9.86	-1.49665	22.84	-2.47922	44.72	-2.80261	67.42
45.0	-0.28534	4.22	-0.69115	10.56	-1.46886	24.27	-2.38448	46.84	-2.63687	69.35
47.5	-0.28447	4.51	-0.68580	11.25	-1.44181	25.67	-2.29523	48.83	-2.48698	71.09
50.0	-0.28361	4.80	-0.68051	11.93	-1.41549	27.02	-2.21106	50.70	-2.35097	72.67
52.5	-0.28274	5.09	-0.67526	12.61	-1.38986	28.34	-2.13159	52.47	-2.22713	74.11
55.0	-0.28188	5.38	-0.67008	13.28	-1.36491	29.63	-2.05651	54.15	-2.11405	75.42
57.5	-0.28102	5.67	-0.66494	13.95	-1.34060	30.88	-1.98548	55.73	-2.01045	76.63
60.0	-0.28017	5.96	-0.65987	14.61	-1.31693	32.10	-1.91827	57.23	-1.91532	77.73
62.5	-0.27932	6.24	-0.65484	15.26	-1.29387	33.29	-1.85458	58.65	-1.82772	78.75
65.0	-0.27847	6.53	-0.64987	15.90	-1.27140	34.45	-1.79418	60.00	-1.74685	79.69
67.5	-0.27763	6.81	-0.64495	16.54	-1.24950	35.58	-1.73687	61.27	-1.67203	80.56
70.0	-0.27677	7.09	-0.64006	17.17	-1.22813	36.68	-1.68241	62.49	-1.60263	81.37

Table S3: Percentage difference in current density with respect to the total electroactive surface area (j) compared to surface coverage for arrays of semicircular nanowires.

Coverage		900mV		850mV		800mV		750mV		700mV	
%	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	
10.0	-0.15024	0.00	-0.39456	0.00	-1.02252	0.00	-2.56108	0.00	-5.89079	0.00	
12.5	-0.15006	0.12	-0.39328	0.32	-1.01392	0.84	-2.50575	2.16	-5.58139	5.25	
15.0	-0.14988	0.24	-0.39202	0.64	-1.00541	1.67	-2.45208	4.26	-5.29504	10.11	
17.5	-0.14969	0.36	-0.39076	0.96	-0.99699	2.50	-2.40003	6.29	-5.02961	14.62	
20.0	-0.14951	0.49	-0.38952	1.28	-0.98865	3.31	-2.34955	8.26	-4.78329	18.80	
22.5	-0.14933	0.60	-0.38825	1.60	-0.98041	4.12	-2.30058	10.17	-4.55434	22.69	
25.0	-0.14915	0.72	-0.38702	1.91	-0.97229	4.91	-2.25305	12.03	-4.34127	26.30	
27.5	-0.14897	0.84	-0.38577	2.23	-0.96424	5.70	-2.20691	13.83	-4.14272	29.67	
30.0	-0.14878	0.97	-0.38453	2.54	-0.95630	6.48	-2.16215	15.58	-3.95749	32.82	
32.5	-0.14861	1.08	-0.38331	2.85	-0.94843	7.25	-2.11867	17.27	-3.78443	35.76	
35.0	-0.14843	1.20	-0.38209	3.16	-0.94066	8.01	-2.07645	18.92	-3.62254	38.51	
37.5	-0.14824	1.33	-0.38085	3.47	-0.93301	8.75	-2.03545	20.52	-3.47097	41.08	
40.0	-0.14807	1.44	-0.37966	3.78	-0.92541	9.50	-1.99559	22.08	-3.32881	43.49	
42.2	-0.14788	1.57	-0.37843	4.09	-0.91791	10.23	-1.95686	23.59	-3.19540	45.76	
45.0	-0.14771	1.68	-0.37723	4.39	-0.91047	10.96	-1.91925	25.06	-3.07003	47.88	
47.5	-0.14752	1.81	-0.37605	4.69	-0.90316	11.67	-1.88265	26.49	-2.95211	49.89	
50.0	-0.14733	1.93	-0.37485	5.00	-0.89590	12.38	-1.84709	27.88	-2.84105	51.77	
52.5	-0.14715	2.05	-0.37367	5.29	-0.88875	13.08	-1.81249	29.23	-2.73635	53.55	
55.0	-0.14699	2.16	-0.37249	5.59	-0.88165	13.78	-1.77884	30.54	-2.63757	55.23	
57.5	-0.14680	2.29	-0.37130	5.89	-0.87465	14.46	-1.74609	31.82	-2.54424	56.81	
60.0	-0.14663	2.40	-0.37013	6.19	-0.86775	15.14	-1.71424	33.07	-2.45603	58.31	
62.5	-0.14644	2.52	-0.36895	6.49	-0.86086	15.81	-1.68322	34.28	-2.37253	59.72	
65.0	-0.14626	2.65	-0.36779	6.78	-0.85411	16.47	-1.65302	35.46	-2.29344	61.07	
67.5	-0.14610	2.76	-0.36664	7.07	-0.84739	17.13	-1.62366	36.60	-2.21851	62.34	
70.0	-0.14591	2.88	-0.36548	7.37	-0.84078	17.77	-1.59499	37.72	-2.14733	63.55	

Table S4: Percentage difference in current density with respect to the total electroactive surface area (j) compared to surface coverage for arrays of cylinders.

Coverage	900mV		850mV		800mV		750mV		700mV	
	%	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)	% dif.	j (A m ⁻²)
10.0	-0.30082	0.00	-0.78828	0.00	-2.03137	0.00	-5.01443	0.00	#####	0.00
12.5	-0.30054	0.09	-0.78561	0.34	-2.01129	0.99	-4.88280	2.63	#####	6.36
15.0	-0.29940	0.47	-0.78037	1.00	-1.98407	2.33	-4.73633	5.55	-9.74097	12.54
17.5	-0.29880	0.67	-0.77678	1.46	-1.96193	3.42	-4.60784	8.11	-9.14191	17.92
20.0	-0.29923	0.53	-0.77627	1.52	-1.94877	4.07	-4.50653	10.13	-8.64275	22.40
22.5	-0.29851	0.77	-0.77237	2.02	-1.92623	5.18	-4.38452	12.56	-8.13563	26.96
25.0	-0.29816	0.88	-0.76958	2.37	-1.90706	6.12	-4.27466	14.75	-7.68634	30.99
27.5	-0.29764	1.06	-0.76627	2.79	-1.88669	7.12	-4.16517	16.94	-7.26683	34.76
30.0	-0.29696	1.28	-0.76251	3.27	-1.86531	8.17	-4.05651	19.10	-6.87514	38.27
32.5	-0.29691	1.30	-0.76063	3.51	-1.84938	8.96	-3.96408	20.95	-6.53668	41.31
35.0	-0.29615	1.55	-0.75666	4.01	-1.82793	10.01	-3.86130	23.00	-6.19987	44.34
37.5	-0.29563	1.73	-0.75342	4.42	-1.80874	10.96	-3.76678	24.88	-5.89647	47.06
40.0	-0.29529	1.84	-0.75074	4.76	-1.79125	11.82	-3.67881	26.64	-5.62090	49.53
42.2	-0.29475	2.02	-0.74748	5.18	-1.77244	12.75	-3.59037	28.40	-5.35934	51.88
45.0	-0.29420	2.20	-0.74418	5.59	-1.75374	13.67	-3.50457	30.11	-5.11552	54.07
47.5	-0.29410	2.23	-0.74223	5.84	-1.73882	14.40	-3.42950	31.61	-4.90094	56.00
50.0	-0.29347	2.44	-0.73873	6.29	-1.72002	15.33	-3.34800	33.23	-4.68693	57.92
52.5	-0.29298	2.61	-0.73567	6.67	-1.70257	16.19	-3.27161	34.76	-4.49083	59.68
55.0	-0.29230	2.83	-0.73208	7.13	-1.68394	17.10	-3.19472	36.29	-4.30285	61.37
57.5	-0.29250	2.77	-0.73103	7.26	-1.67208	17.69	-3.13404	37.50	-4.14691	62.77
60.0	-0.29186	2.98	-0.72755	7.70	-1.65413	18.57	-3.06230	38.93	-3.98192	64.25
62.5	-0.29127	3.17	-0.72426	8.12	-1.63686	19.42	-2.99383	40.30	-3.82841	65.63
65.0	-0.29034	3.48	-0.71999	8.66	-1.61728	20.39	-2.92235	41.72	-3.67688	66.99
67.5	-0.28991	3.63	-0.71717	9.02	-1.60156	21.16	-2.86041	42.96	-3.54424	68.18
70.0	-0.29003	3.59	-0.71592	9.18	-1.59000	21.73	-2.80817	44.00	-3.42985	69.21

Table S5: Percentage difference in current density with respect to the total electroactive surface area (j) compared to cylinder radius for arrays of cylinders 5 nm high with a 40% coverage.

Coverage		900mV		850mV		800mV		750mV		700mV	
%	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	j (A m^{-2})	% dif.	
100	-0.29840	0.00	-0.77242	0.00	-1.92875	0.00	-4.40386	0.00	-8.22348	0.00	
50	-0.29804	0.12	-0.76993	0.32	-1.91266	0.83	-4.31338	2.05	-7.85174	4.52	
20	-0.29698	0.48	-0.76257	1.27	-1.86559	3.27	-4.05740	7.87	-6.87642	16.38	
10	-0.29529	1.04	-0.75074	2.81	-1.79125	7.13	-3.67881	16.46	-5.62090	31.65	
5	-0.29227	2.05	-0.72874	5.66	-1.65724	14.08	-3.06912	30.31	-3.99252	51.45	

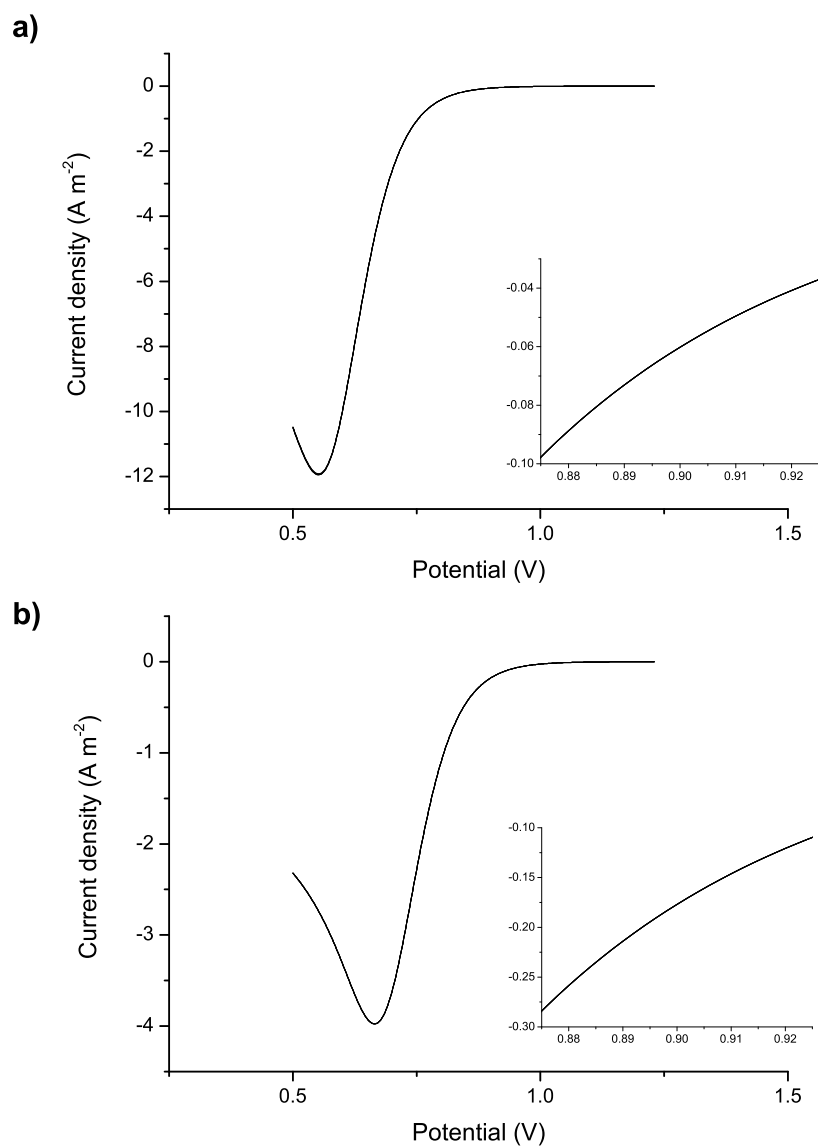


Figure S1: Simulated voltammograms for hemispherical nanoparticle modified electrodes, of varying sizes (5, 10, 20, 50, 100 nm in radius) in terms of current density with respect to the total electroactive surface area for fixed coverages of a) 20% and b) 60%. The inset for each graph shows the region around 900mV.

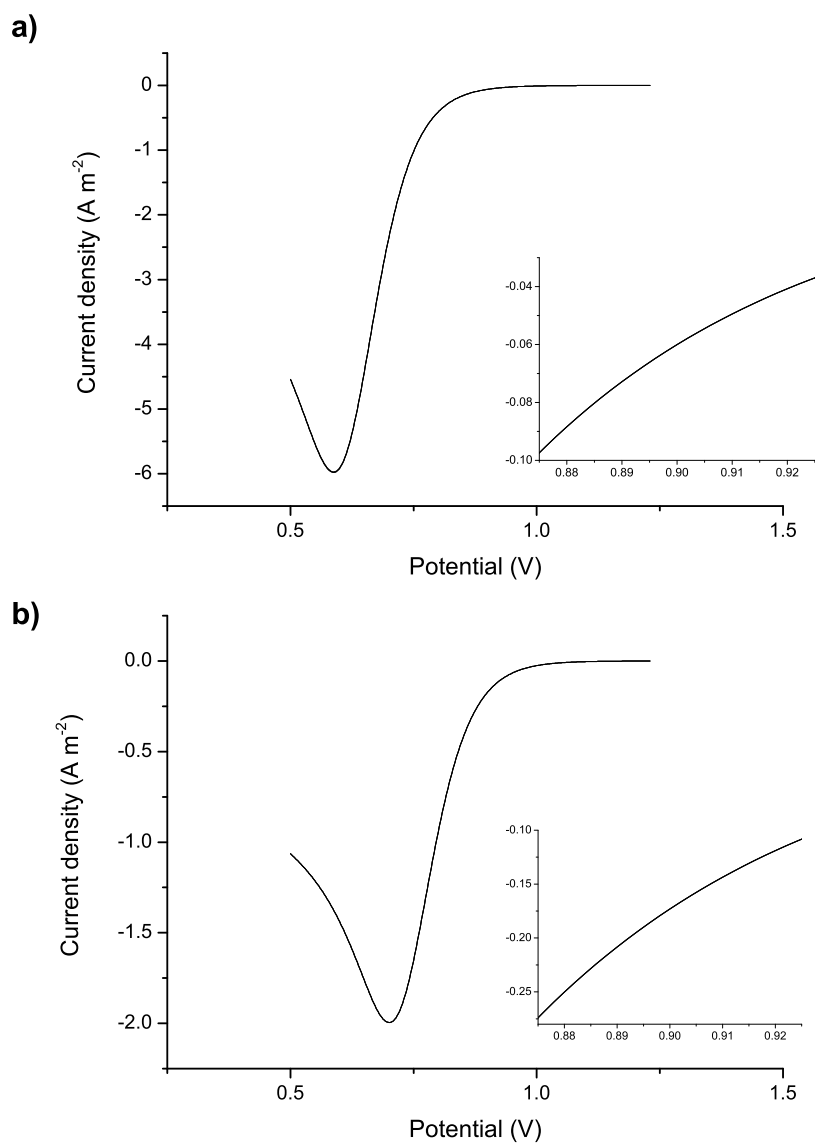


Figure S2: Simulated voltammograms for spherical nanoparticle modified electrodes, of varying sizes (20, 50, 100 nm in radius) in terms of current density with respect to the total electroactive surface area for fixed coverages of a) 20% and b)60%. The inset for each graph shows the region around 900mV.

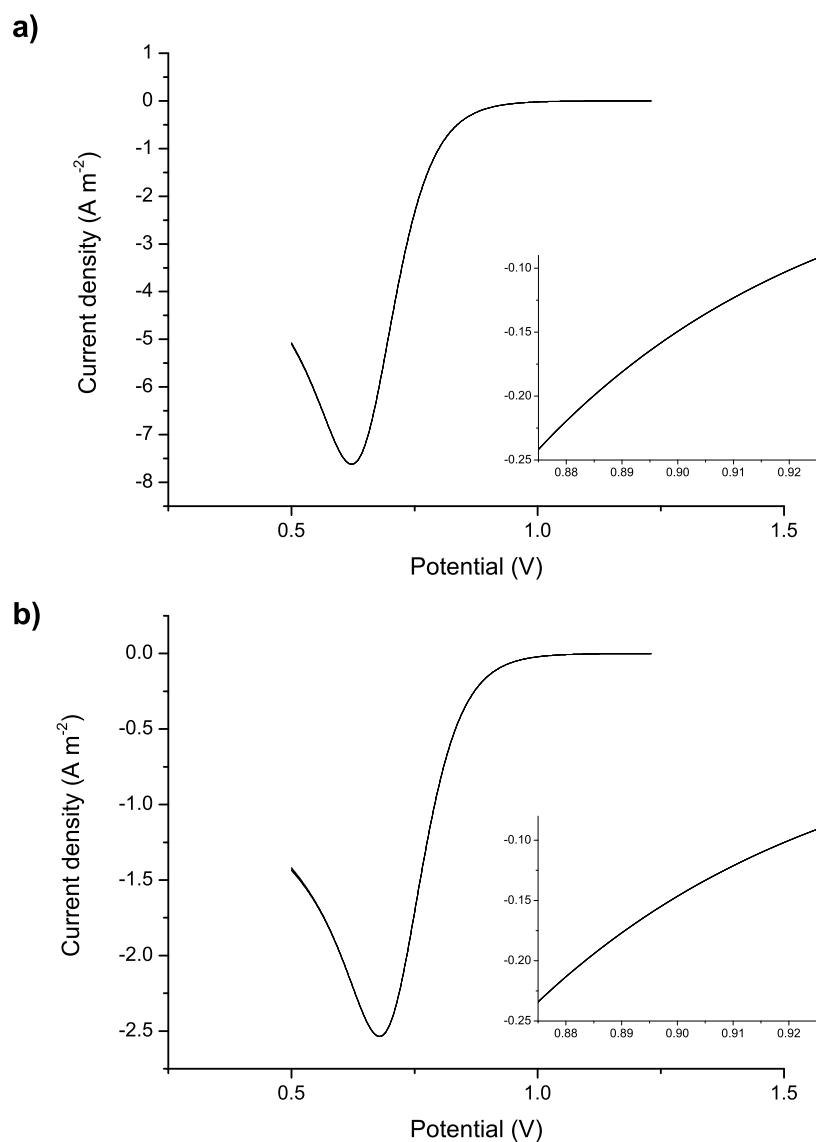


Figure S3: Simulated voltammograms for semicircular nanowire modified electrodes, of varying sizes (5, 10, 20, 50, 100 nm in radius) in terms of current density with respect to the total electroactive surface area for fixed coverages of a) 20% and b)60%. The inset for each graph shows the region around 900mV.