SUPPORTING INFORMATION

Assessment of Microbial Fuel Cell Configurations and Power Densities

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In Literature | Calculated

sMFC

Reference	Year	w/FeCN	Substrate	Reactor T	Volume (mL) Anode	Volume (mL) Cathode	Volume (mL) Total	Area (cm^2) Anode	Area (cm^2) Membrane	Area (cm^2) Cathode	Power (mW)	Area Power Density (W/m^2) Anode (or Total)	Area Power Density (W/m^2) Cathode	Volume Power Density (W/m^3) Anode	Volume Power Density (W/m^3) Cathode	Volume Power Density (W/m^3) Reactor	Cathode SSA (m^2/m^3)
Scott et al., 2008, J. of Chem. Tec	2008	N	Coastal shoreline	SMFC			3217	95		176	0.26	0.028	0.015			0.082	5
Liu et al., 2015, J. of Power Sourc	2015	N	Coastal sediment	SMFC			650000			113	6.19	#DIV/0!	0.55			0.010	0.017
Karra et al., 2013, Bioresour. Tecl	2013	N	Lake, Connecticut	SMFC			100000			522	9.92	#DIV/0!	0.19			0.099	0.52
Dominguez-Garay et al., 2013, Er	2013	N	Alluvial plain, Spain	SMFC			250	4.8		52	0.011	0.023	0.0021			0.044	21
Tender et al., 2008, J. of Power S	2008	N	River	SMFC			185714	3721		3721	3.4	0.009	0.0092			0.018	2.0
Tender et al., 2002, Nature Biote	2002		Newport sediment	SMFC			167000	1908		1908	0.0053	0.028	0.028			0.000032	0.0011

uMFC

					Volume (mL)			Area (cm^2)				Area Power Density (W/m^2)		Volume Power Density (W/m^3)			Cathode SSA
Reference	Year	w/FeCN	Substrate	Reactor Type	Anode	Cathode	Total	Anode	Membrane	Cathode	Power (mW)	Anode	Cathode	Anode	Cathode	Reactor	(m^2/m^3)
Mukherjee et al., 2013, Sensors a	2013	Y	L-broth	uMFC	0.0015	0.00150	0.0030	0.060	0.06	0.06	0.00000054	0.0001	0.00009	0.4	0.4	0.2	2000
Fraiwan et al., 2013, Fuel Cells, "	2013	Y	L-broth	uMFC	0.0500	0.05000	0.1000	1.0		1	0.000196	0.0020	0.00196	3.9	3.9	2.0	1000
Choi & Chae, 2013, Sensors and	2013	Y	Acetate	uMFC	0.0254	0.02540	0.0508	1.0	1	1	0.095	0.9500	0.95	3740.2	3740.2	1870	1969
Qian et al., 2011, Bioresour. Tech	2011	Y	Trypticase soy broth	uMFC	0.0040	0.00400	0.0080	0.400		0.4	0.00025	0.0063	0.00625	62.5	62.5	31.3	5000
Choi et al., 2011, Lab Chip, "A uL	2011	Y	Acetate	uMFC	0.0045	0.00450	0.0090	2.25	2.25	2.25	0.01035	0.0460	0.046	2300.0	2300.0	1150	25000
Ren et al., 2014, Biosens. And Bi	2014	Y	Acetate	uMFC	0.1000	0.10000	0.2000	4.000		4	0.33	0.8300	0.83	3320.0	3320.0	1660	2000
Fraiwan et al., 2014, Fuel Cells, "	2014	Y	Acetate	uMFC	0.0470	0.04700	0.0940	0.28		0.28	0.0018	0.0650	0.065	38.7	38.7	19.4	298
Inoue et al., 2012, Sensors and A	2012	Y	Anaerobic minimal r	uMFC	0.0400	0.04000	0.0800	0.09		0.09	0.00032	0.0356	0.03555556	8.0	8.0	4.0	113
Mink et al., 2012, Nano Lett., "V	2012	Y	Acetate	uMFC	0.0013	0.00125	0.0025	0.25		0.25	0.00049	0.0196	0.0196	392.0	392.0	196.0	10000
Qian et al., 2009, Lab on a Chip, "	2009	Y	Lactate	uMFC	0.0015	0.00400	0.0055	0.15		0.4	0.0000225	0.0015	0.0005625	15.0	5.6	4.1	7273
Mink et al., 2014, NPG Asia Mate	2014	N	Saliva	uMFC	0.0250		0.0250	0.25		0.25	0.00015	0.0060	0.006	6.0		6.0	1000
Ieropoulos et al., 2013, Internati	2013	N	Urine	uMFC	0.7000	0.70000	1.4000	28		28	0.026	0.0093	0.00928571	37.1	37.1	18.5	1992
Mink & Hussain, 2013, ACS Nano	2013	N	Acetate	uMFC	0.0750		0.0750	0.25		0.25	0.00048	0.0190	0.019	6.3		6.3	333

MFC-single substrates

					Volume (mL)			Area (cm^2)				Area Power Density (W/m^2)		Volume Power Density (W/m^3)			Cathode SSA
Reference	Year	w/FeCN	Substrate	Reactor Typ	Anode	Cathode	Total	Anode	Membrane	Cathode	Power (mW)	Anode	Cathode	Anode	Cathode	Reactor	(m^2/m^3)
Torres et al., 2008, Environ. Sci. Tech	2008	N	Acetate	MFC	20		20		7.5	7.5	2.1	n/a	2.8	105	n/a	105	38
Kim et al., 2011, Journal of Power Sou	2011	N	Acetate	MFC	250		250	12.5		27	1.5	1.22	0.56	6	n/a	6	11
Feng et al., 2009, Bioresource Techno	2010	N	Glucose	MFC	210		210			38	4.4	n/a	1.15	21	n/a	21	18
Zhang et al., 2013, Bioresour. Techno	2013	N	Acetate	MFC	1150	1300	2450			1400	9.3	n/a	0.07	8	7.17	4	57
Miyahara et al., 2013, J. of Biosci. Ano	2013	N	Starch, Bactoye		1000		1000	1440		1440	22	0.15	0.15	22	n/a	22	144
Zhang et al., 2014, Environ. Sci. Techr	2014	N	Acetate		28		28			7	1.1	n/a	1.56	39	n/a	39	25
Lanas et al., 2014, J. of Pow. Sour., "E	2014	N	Acetate		174		174	34.65		35	4.4	1.28	1.27	26	n/a	26	20
Wei et al., 2012, RSC Advances, "Dev	2012	N	Acetate		28		28			7	0.9	n/a	1.31	33	n/a	33	25
Logan et al., 2007, Environ. Sci. Techr	2007	N	Acetate		28		28	2200		7	1.7	0.0076	2.4	60	n/a	60	25
Fan et al., 2012, Energy Environ. Sci.,	2012	N	Acetate		30		30	200		200	62	3.12	3.1	2077	n/a	2077	667
Xing et al., 2008, Environ. Sci. Techno	2008	N	Acetate		22		22			7	1.9	n/a	2.72	87	n/a	87	32
Liu et al. 2008, Journal of Power sour	2008	N	Acetate	MFC-flat an	28		28	7		7	0.4		0.56			14	25
Liu et al. 2008, Journal of Power sour	2008	N	Acetate	MFC-flat an	520		520	757		161	8.4		0.52			16	150
Wang&Han, 2009. BiotechnolLett, "A	2009	N	Acetate	Cassette	400		640	160		60	7		1.806			16	9.4
Yu et al., 2012, Electricity generation	2012	N	Glucose	Cassette			5700	648		648	49		0.754			9	11
Wang&Han, 2009. BiotechnolLett, "A	2009	N	Acetate	Cassette	400		640	160		60	11		1.806			17	9.4

MFCs with wastewaters

Reference	Year	w/FeCN	Substrate	Reactor Typ	Volume (mL) Anode	Volume (mL) Cathode	Volume (mL) Total	Area (cm^2) Anode	Area (cm^2) Membrane	Area (cm^2) Cathode	Power (mW)	Area Power Density (W/m^2) Anode (or Total)	Area Power Density (W/m^2) Cathode	Volume Power Density (W/m^3) Anode	Volume Power Density (W/m^3) Cathode	Volume Power Density (W/m^3) Reactor	Cathode SSA (m^2/m^3)
Dong et al., 2013, Biosens. And Bioelectr., "Microbial fuel cell as p	2013	N	Artificial colon contents	MFC	600		600	280		16	1.6	0.0571	0.012	2.7	n/a	2.7	227
Ajayi & Weigele, 2012, Bioresour. Technol., "A terracotta bio-batt	2012	N	Hay extract	MFC	800		800	320		115	1.06	0.0331	0.092	1.3	n/a	1.3	14
Choi & Liu, 2014, Bioresour. Technol., "Power generation and oil s	2014	N	Oil sands process-affectec	MFC	28		28			7	0.000061	n/a	0.000	0.0	n/a	0.0022	25
Zhang et al., 2014, Bioresour. Technol., "Treating refinery wastew	2014	N	Wastewater (domestic)	MFC	13		13	560		7	0.252	0.0045	0.360	19.4	n/a	19.4	54
Kelly & He, 2014, Bioresour. Technol., "Understanding the applica	2014	N	Wastewater (cheese)	MFC	500	800	1300		425	542	1.6	n/a	0.030	3.2	2	1.2	42
Jia et al., 2013, Bioresour. Technol., "Electricity generation from fc	2013	N	Wastewater (food waste)	MFC	22		22			7	0.40	n/a	0.566	18.0	n/a	18.0	32
Liu & Li, 2007, Biochem. Engr. Journal, "Effects of bio- and abio-fa	2007	N	Wastewater (monosodiun	MFC	250	250	500	65	1.77	65	0.091	0.0129	0.014	0.4	0.364	0.2	13
Sciarria et al., 2013, Bioresour. Technol., "Using olive mill wastewa	2013	N	Wastewater (olive mill) ar	MFC	28		28	2200		7	0.087	0.00040	0.125	3.1	n/a	3.1	25
Choi & Ahn, 2013, J. of Environ. Mgmt., "Continuous electrcitiy ge	2013	N	Wastewater (domestic)	MFC	112		112	2200		28	1.18	0.00535	0.420	10.5	n/a	10.5	25
Ahn & Logan, 2013, Appl. Microbiol. Biotechnol., "Domestic waste	2013	N	Wastewater (domestic)		130		130	26		35	0.42	0.162	0.120	3.2	n/a	3.2	27
Feng et al., 2008, Appl. Microbiol. Biotechnol., "Brewery wastewa	2008	N	Wastewater (brewery)		28		28	7		7	0.14	0.205	0.205	5.1	n/a	5.1	25
Zhang et al., 2011, Water Sci. & Technol., "Submersible microbial	2011	N	Wastewater (anaerobic di	MFC	591	9	600	9		9	0.29	0.318	0.318	0.5	31.8	0.5	1.5
Sonawane et al., 2013, International J. of Hydrogen Energy, "Mult	2013	N	Wastewater (distillery)	Large-Scale	3270		3270	847		255	15.2	0.180	0.597	4.7	n/a	4.7	7.8
Zhuang et al., 2012, Bioresour. Technol., "Long-term evaluation of	2012	N	Wastewater (brewery)	Large-Scale	10000		10000	5700		6200	41	0.072	0.066	4.1	n/a	4.1	62
Zhao & Song, 2014, Water Sci. & Technol., "Simultaneous carbon a	2014	N	Wastewater (chicken mar	Large-Scale	5000	5000	10000	800	113	800	1.3	0.016	0.016	0.3	0.26	0.1	8.0
Ryu et al., 2013, Proce. Biochem., "Simultaneous carbon and nitro	2013	N	Wastewater (piggery)	Large-Scale	4000	1000	5000			270	5.7	n/a	0.210	1.4	5.66	1.1	5.4
Dong et al., 2015, A 90-liter stackable baffled microbial fuel cell fo	2015	N	Wastewater (brewery)	Large-Scale	100000		100000	4800		6000	103		0.171			1.03	6.0
Hays and Logan, 2011, Performance of two different types of anoi	2011	N	Wastewater (domestic)	SEA-MFC-1s	13		13			7			0.130			7	54
Hays and Logan, 2011, Performance of two different types of anoi	2011	N	Wastewater (domestic)	SEA-MFC-2s	13		13			7			0.240			12.9	54
Ahn & Logan 2014, Different electrode configurations to optimize	2014	N	Wastewater (domestic)	SEA-MFC-2s	130		130	26		35	1.15		0.328	8.8	n/a	8.8	27
Ahn & Logan 2014, Different electrode configurations to optimize	2014	N	Wastewater (domestic)	SPA-MFC-2s	130		130	26		35	0.987		0.282	7.6	n/a	7.6	27
Shimoyama etal. 2008. Electricity generation from model organic	2008	N	Artificial WW	cassette	1000		3726	1368		1368	123	0.899	0.899			33	37
Miyahara etal., 2013, Use of cassette-electrode microbial fuel cell	2013	N	Artificial WW	cassette	1000		3726	1440		1440	22	0.150	0.150			6	39
Yu et al., 2012, Electricity generation and microbial community in	2012	N	Wastewater (domestic)	Cassette			5700	648		648	10		0.149			1.7	11