

Table 1. Full EFCs with a maximum power density (P_{\max}) greater than 1 mW cm⁻²

Glucose/O ₂ EFCs						
Bioanode	Biocathode	Note	P_{\max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
CF/GDH/DI/VK ₃ /NADH (1.5 mm thick); MET; 400 mM glucose	CF/K ₃ [Fe(CN) ₆]/BOD; MET; Air-breathing	Two-compartment	1.45	0.8	Continuous operation over 2 h	1
MWCNTs-PEDOT yarn/Os polymer(I)/GOx; MET; 60 mM glucose	MWCNTs-PEDOT yarn/Os polymer(II)/BOD; MET; O ₂ -saturated	One-compartment	2.18	0.7	83% remaining after 24 h	2
HPC/AQ2S/DI/NAD/GDH; MET; 800 mM glucose	CF/K ₃ [Fe(CN) ₆]/BOD; MET; Air-breathing	Two-compartment	1	0.8	Can be used for > 10 cycles	3
GCE/MWCNTs/NQ-4-LPEI/GDH; MET; Stirred 100 mM glucose	CP/anthracene-MWCNTs/BOD; MET; Air-equilibrated	One-compartment	2.3	0.86	Potential decreased from 0.86 to 0.71 V after 24 h operation	4
MWCNTs/NQ/GOx/catalase; MET; 50 mM glucose	MWCNTs/Laccase; DET; O ₂ -saturated	One-compartment	1.54	0.76	60% decrease over 7 days' storage	5
MWCNTs/GOx/catalase(3 mm thick); MET; 50 mM glucose	MWCNTs/Laccase; DET	One-compartment	1.3	0.95	Stable for 1 month	6
H ₂ /O ₂ EFCs						
Bioanode	Bio-/cathode	Note	P_{\max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
CNF/ <i>Aquifex aeolicus</i> hydrogenase; DET; H ₂ -saturated	CNF/ <i>B. pumilus</i> BOD; DET; O ₂ -saturated	Two-compartment	1.5 at 60 °C	1.06	Decreased by 60% at 0.5 V after 24 h	7
WPCC/KB/[NiFe] hydrogenase; DET;	WPCC/KB/ <i>Mv</i> BOD; DET;	Dual gas-diffusion type;	6.1	1.12	n/a	8

H ₂ diffusion electrode	Air-breathing	One-compartment				
CMC/ <i>E. coli</i> Hydrogenase-1; DET	CMC/ <i>Mv</i> BOD; DET	In a 78% H ₂ –22% air mixture; One-compartment	1.67 (per anode area)	1.068	Retained 90% output after continuously working for 24 h	9
CF/CNTs/ <i>Aquifex aeolicus</i> hydrogenase; DET; H ₂ -saturated	CF/CNTs/ <i>Bp</i> BOD; DET; O ₂ -saturated	Two-compartment	1.7 at 50 °C	1.02	5% loss after 17 h operation	10
WPCC/ <i>KB/Dv</i> [NiFe]-hydrogenase; DET; 100% H ₂	WPCC/ <i>KB/Mv</i> BOD; DET; 100% O ₂	Dual gas-diffusion; One-compartment	8.4	1.14	n/a	11
Carbon cloth/ <i>Dv</i> [NiFe]-hydrogenase/viologen-polymer; MET; 100% H ₂	Carbon cloth/ <i>Mv</i> BOD; DET; 100% O ₂	Dual gas-diffusion; One-compartment	3.6	1.13	Retained 46% output after 24 h continuous operation	12
Fructose/O ₂ EFCs						
Bioanode	Bio-/cathode	Note	P _{max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
CP/CCG/FDH; DET; 500 mM fructose	CP/ <i>KB/Mv</i> BOD; DET; Air-breathing	DET-type EBFC; One-compartment	2.6	0.79	n/a	13
CNTs/FDH; DET; 200 mM fructose	CNTs/laccase; DET; O ₂ -saturated	One-compartment	1.8	0.77	Retained 84% output after 24 h continuous operation	14
GCE/MWCNTs/CPPy/FDH; DET; 100 mM fructose	GCE/MWCNTs/CPPy/ABTS/laccase; MET; O ₂ -saturated	One-compartment	2.1	0.59	60% loss after 1 week operation	15
Formate/O ₂ EFCs						
Bioanode	Bio-/cathode	Note	P _{max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
NG/AuNPs/FoDH;	NG/AuNPs/Laccase;	One-	1.96	0.95	Not directly	16

5 mM NAD ⁺ and 50 mM formic acid	MET; 0.5 mM ABTS	compartment;			measured	
WPCC/KB/viologen-functionalized polymer/FoDH; MET; 300 mM formate	WPCC/KB/M _v BOD/ABTS; MET; O ₂ diffusion electrode	One-compartment; Thick electrode	12	0.78	n/a	17

Sucrose/O ₂ EFCs						
Bioanode	Bio-/cathode	Note	P _{max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
Carbon felt/CNTs/TTF/GOx/FDH/MUT/IN V; MET; 50 mM sucrose	Carbon felt/CNTs/ABTS/BOD; MET; O ₂ -saturated	Deep oxidation of sucrose	2.9	0.69	Bioanode displayed good stability for 0.5 h	18

Ethanol/O ₂ EFCs						
Bioanode	Bio-/cathode	Note	P _{max} (mW cm ⁻²)	OCV (V)	Stability	Ref.
MDB/AuNPs/gel/ADH; MET; 1 mM NAD ⁺ and 1 mM ethanol	AuNPs/gel/laccase; DET; Air-equilibrated	One-compartment;	1.56	0.86	80% loss after 36 days	19
PAN nanofiber/Au/Super-P/ADH/NAD ⁺ /DI/VK ₃ ; MET; ~69 mM ethanol	PAN nanofiber/Au/Super-P/laccase/ABTS; MET; O ₂ -saturated	Two-compartment	1.6	0.99	Pronounced loss of NAD ⁺	20

Abbreviations: CF: Carbon fiber; GDH: glucose dehydrogenase; DI: diaphorase; VK₃: vitamin K₃; NADH: β-Nicotinamide adenine dinucleotide disodium salt (reduced form); BOD: bilirubin oxidase; MET: mediated electron transfer; MWCNTs: multi-walled carbon nanotubes; PEDOT: poly(3,4-ethylenedioxythiophene); Os polymer(I): poly(*N*-vinylimidazole)-[Os(4,4'-dimethoxy-2,2'-bipyridine)₂Cl]⁺²⁺; Os polymer(II): poly(acryl amide)-poly(*N*-vinylimidazole)-[Os(4,4'-dichloro-2,2'-bipyridine)₂]⁺²⁺; HPC: hierarchical porous carbon; AQ2S: anthraquinone-2-sulfonate; NQ-4-LPEI: naphthoquinone(NQ)-modified linear polyethyleneimine; CP: carbon paper; CNF: carbon nanofibers; WPCC: water proof carbon paper; KB: Ketjen black; CMC: compacted mesoporous carbon; CCG: carbon cryogel; CPPy: cellulose/polypyrrole composite; NG: nitrogen-doped graphene; FoDH: formate dehydrogenase; ABTS: 2,2'-azinobis(3-ethylbenzothiazoline-6-sulfonate); CNTs: carbon nanotubes; TTF: tetrathiafulvalene; GOx: glucose oxidase; FDH: fructose dehydrogenase; MUT: mutarotase; INV: invertase; MDB: Meldola's blue; AuNPs: gold nanoparticles; PAN: polyacrylonitrile.

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