

**Hydrogen consumption and methanogenic community evolution in anodophilic biofilms
in single chamber microbial electrolysis cells under different startup modes**

Wenzong Liu^{1,2,3}, Yongjian Piao³, Fugui Zhang³, Lin Liu³, Dongfang Meng³, Jun Nan², Ye Deng^{1*}, Aijie
Wang^{1,2*}

¹ State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology
(SKLUWRE, HIT), Harbin, 150090, China

² Key Laboratory of Environmental Biotechnology, Research Center for Eco-Environmental Sciences,
Chinese Academy of Sciences, Beijing, 100085, China

³Longjiang Environmental Protection Group co., LTD, Harbin 150056, China

Corresponding author:

Ye Deng

Key Laboratory of Environmental Biotechnology, Research Center for Eco-Environmental Sciences,
Chinese Academy of Sciences, 18 Shuangqing Road, Haidian District, Beijing 100085, China

E-mail: yedeng@rcees.ac.cn, 86-01-62840082

Also corresponding author:

Aijie Wang

Key Laboratory of Environmental Biotechnology, Research Center for Eco-Environmental Sciences,
Chinese Academy of Sciences, 18 Shuangqing Road, Haidian District, Beijing 100085, China

E-mail: ajwang@rcees.ac.cn, 86-01-62915515

Table S1. Gene overlap (unshaded number and percentages), gene uniqueness (shaded gene number and percentages), and diversity indices for each sample.

| Reactors | #1 | #2 | #3 | #4 | #5 | #6 |
|-----------------------|----------|------------|------------|-------------|-------------|-------------|
| #1 | 86(6.4%) | 784(41.7%) | 847(42.0%) | 1039(47.6%) | 1164(34.6%) | 1028(32.4%) |
| #2 | | 112(8.5%) | 850(42.9%) | 1004(45.9%) | 1086(31.8%) | 998(31.4%) |
| #3 | | | 158(10.4%) | 1128(49.9%) | 1258(36.6%) | 1193(37.5%) |
| #4 | | | | 125(6.7%) | 1628(47.4%) | 1402(42.1%) |
| #5 | | | | | 778(24.4%) | 1950(47.6%) |
| #6 | | | | | | 738(25.8%) |
| No. of genes detected | 1347 | 1316 | 1515 | 1875 | 3185 | 2858 |
| Shannon Diversity | 6.9 | 6.9 | 7.0 | 7.2 | 7.8 | 7.7 |



Figure S1 Experimental single chamber microbial electrolysis cells

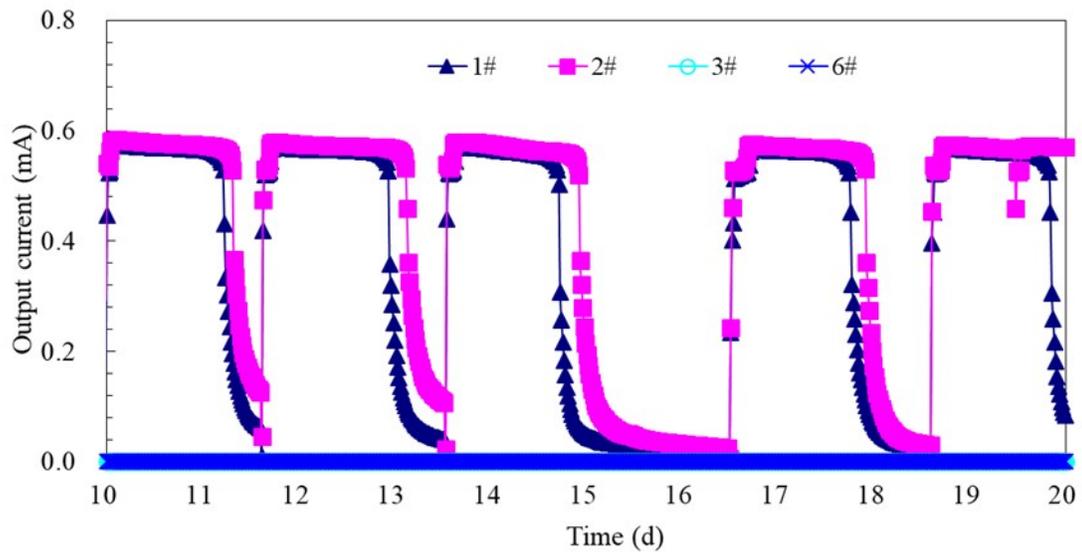


Figure S2 Current produced by reactors during enrichment: #1 and #2, closed circuit operation (1000 Ω); #3, open circuit MFC (control); #6, open circuit MEC (control).

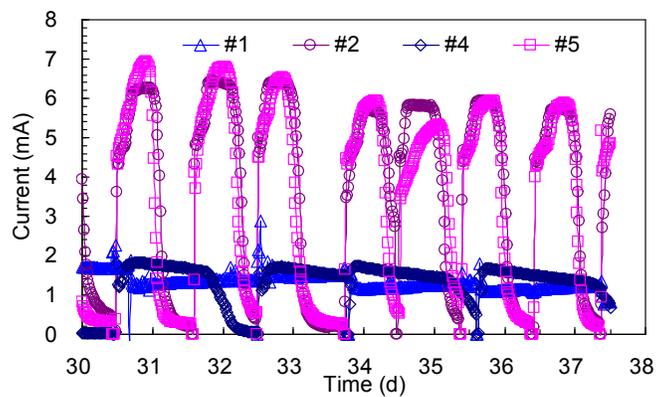
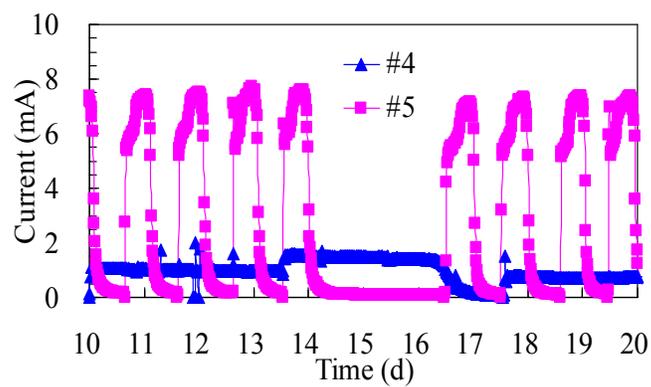


Figure S3 Current produced by MECs at applied voltages of 0.3 V (#4) or 0.7 V (#5) and compared to those switched from MFC mode to MEC, at applied voltages of 0.3 V (#1, #3) and 0.7 V (#2, #4)