

## Supplementary Information

### Methane functionalization in heterogeneous photocatalysis

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Table S1 | Summary of heterogeneous photocatalytic methane functionalization (Note: Classification is based on the predominant product in different systems)

Entry	Photocatalyst	Reaction conditions (including the light source, reactor and others)	Product yield	Product selectivity	AQE (%)	Ref.
<b>Methanol</b>						
1	FeO <sub>x</sub> /TiO <sub>2</sub>	300 W Xenon (Xe) lamp; 25 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 70 μmol CH <sub>4</sub> ; 8 μmol H <sub>2</sub> O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 3 h	352 μmol g <sup>-1</sup> h <sup>-1</sup>	90%	not reported	S1
2	Pd <sub>1</sub> /2DT	300 W Xe lamp; batch reactor; 20 mg catalyst; 20 bar CH <sub>4</sub> ; 200 μL H <sub>2</sub> O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 4 h	44 μmol g <sup>-1</sup> h <sup>-1</sup>	94%	not reported	S2
3	Pd <sub>1</sub> FeO <sub>x</sub> /aUiO(H)	Xe lamp; 100 mW cm <sup>-2</sup> ; flow reactor; membrane; humidified CH <sub>4</sub> and O <sub>2</sub> mixture gas (v/v = 1/1); 215 h	14400 μmol g <sup>-1</sup> h <sup>-1</sup>	100%	not reported	S3
4	ZnO/Fe <sub>2</sub> O <sub>3</sub>	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 1 bar CH <sub>4</sub> ; 5 mL H <sub>2</sub> O; 1.5 h	178.3 μmol g <sup>-1</sup> h <sup>-1</sup>	~ 100%	not reported	S4
5	AuPd/ZnO	300 W Xe lamp; 300 mW cm <sup>-2</sup> ; batch reactor; 2 mg catalyst; 29 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 30 mL H <sub>2</sub> O; 2 h	8.1 mmol g <sup>-1</sup> h <sup>-1</sup>	88.2%	6.4 (365 nm)	S5
6	Ag <sub>NPs</sub> /TiO <sub>2(001)</sub>	300 W Xe lamp; 450 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	4.8 mmol g <sup>-1</sup> h <sup>-1</sup>	79.4%	not reported	S6
7	Au <sub>NPs</sub> /In <sub>2</sub> O <sub>3</sub>	300 W Xe lamp; 250 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 10 bar O <sub>2</sub> ; 180 mL H <sub>2</sub> O; 3 h	1.98 mmol g <sup>-1</sup> h <sup>-1</sup>	89.42%	1.4 (365 nm)	S7
8	Au <sub>NPs</sub> /ZnO	Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 15 bar CH <sub>4</sub> ; 5 bar O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 2 h	690 μmol g <sup>-1</sup> h <sup>-1</sup>	99.1%	not reported	S8
9	AuFe-ZnO	300 W Xe lamp; batch reactor; 40 mg catalyst; 18 bar CH <sub>4</sub> ; 2 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 1 h	1365 μmol g <sup>-1</sup> h <sup>-1</sup>	90.7%	not reported	S9
10	Pd <sub>NPs</sub> -ZnTi-LDH	300 W Xe lamp; 150 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	3155 μmol g <sup>-1</sup> h <sup>-1</sup>	63.7%	not reported	S10

11	Au <sub>1</sub> /BP	300 W Xe lamp; 382 mW cm <sup>-2</sup> ; batch reactor; 200 mg catalyst; 30 bar CH <sub>4</sub> ; 3 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 2 h	57 μmol g <sup>-1</sup> h <sup>-1</sup>	99%	17.4 (350 nm)	S11
12	q-BiVO <sub>4</sub>	Xe lamp; 170 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 10 bar CH <sub>4</sub> ; 10 bar O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 3 h	370 μmol g <sup>-1</sup> h <sup>-1</sup>	96.6%	3.07 (365 nm)	S12
13	Au-CoO <sub>x</sub> /TiO <sub>2</sub>	300 W Xe lamp; 450 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	1500 μmol g <sup>-1</sup> h <sup>-1</sup>	57%	1.2 (368 nm)	S13
14	Au <sub>1</sub> /WO <sub>3</sub>	300 W Xe lamp; batch reactor; 20 mg catalyst; 20 bar CH <sub>4</sub> ; 200 μL H <sub>2</sub> O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 1 h	590 μmol g <sup>-1</sup> h <sup>-1</sup>	75%	not reported	S14
15	Au <sub>1</sub> -CuO <sub>x</sub> /ZnO	300 W Xe lamp; 38 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 8 bar CH <sub>4</sub> ; 2 bar O <sub>2</sub> ; 30 mL H <sub>2</sub> O; 4 h	8423 μmol g <sup>-1</sup> h <sup>-1</sup>	100%	4.8 (365 nm)	S15
16	Fe/ZnOHP	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 5 mg catalyst; 15 bar CH <sub>4</sub> ; 50 mL H <sub>2</sub> O; 4 h	1009 μmol g <sup>-1</sup> h <sup>-1</sup>	96%	not reported	S16
17	Fe-Au/STO <sub>v</sub>	300 W Xe lamp; 150 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 30 mL H <sub>2</sub> O; 2 h	7.53 mmol g <sup>-1</sup> h <sup>-1</sup>	95.4%	15.8 (365 nm)	S17
18	Au/CuSeO <sub>2.82</sub>	300 W Xe lamp; 350 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 1 bar CH <sub>4</sub> and O <sub>2</sub> mixture gas (v/v = 2/1); 40 mL H <sub>2</sub> O; 2 h	2.4 mmol g <sup>-1</sup> h <sup>-1</sup>	95.3%	1.5 (800 nm)	S18
19	Pd-ZnO	300 W Xe lamp; 600 mW cm <sup>-2</sup> ; flow reactor; 0.5 mg catalyst; 50 mL min <sup>-1</sup> of CH <sub>4</sub> ; 10 mL min <sup>-1</sup> of air; 3.5 mL min <sup>-1</sup> of H <sub>2</sub> O; 135 h	6584 μmol g <sup>-1</sup> h <sup>-1</sup>	~ 100%	12.7 (350 nm)	S19
20	Pt <sub>NP<sub>s</sub></sub> -mIn <sub>2</sub> O <sub>3-x</sub> (OH) <sub>y</sub>	LED lamp (420 nm); 50 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 27.5 bar CH <sub>4</sub> ; 2.5 bar O <sub>2</sub> ; 50 mL H <sub>2</sub> O; 1 h	3.97 mmol g <sup>-1</sup> h <sup>-1</sup>	90.9%	3.15 (420 nm)	S20
<b>Methyl hydroperoxide</b>						
21	Ru <sub>1</sub> O <sub>x</sub> /ZnO	300 W Xe lamp; 150 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 1 h	321 μmol g <sup>-1</sup> h <sup>-1</sup>	90.9%	5.1 (320 nm)	S21
22	TiO <sub>2</sub>	300 W Xe lamp; 380 mW cm <sup>-2</sup> ; batch reactor; 1 mg catalyst; 1 bar CH <sub>4</sub> ; 500 μmol H <sub>2</sub> O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 1 h	2050 μmol g <sup>-1</sup> h <sup>-1</sup>	99.8%	not reported	S22
23	AuCu/ZnO	300 W Xe lamp; batch reactor; 20 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	6453.2 μmol g <sup>-1</sup> h <sup>-1</sup>	57.4%	14.1 (365 nm)	S23
24	Au <sub>NP<sub>s</sub></sub> /ZnO	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	6170 μmol g <sup>-1</sup> h <sup>-1</sup>	46.9%	11.7 (368 nm)	S24
25	FeCA	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 1 bar CH <sub>4</sub> ; 2 mmol H <sub>2</sub> O <sub>2</sub> ; 9.8 mL H <sub>2</sub> O; 1.5 h	13.6 μmol g <sup>-1</sup> h <sup>-1</sup>	~ 100%	not reported	S25
<b>Formaldehyde</b>						
26	A/R-TiO <sub>2</sub>	300 W Xe lamp; 130 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 5 bar O <sub>2</sub> ; 180 mL H <sub>2</sub> O; 3 h	8.09 mmol g <sup>-1</sup> h <sup>-1</sup>	97.4%	not reported	S26
27	Au <sub>1</sub> /In <sub>2</sub> O <sub>3</sub>	300 W Xe lamp; 250 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 10 bar	2.03 mmol g <sup>-1</sup> h <sup>-1</sup>	97.62%	0.63 (365 nm)	S7

		O <sub>2</sub> ; 180 mL H <sub>2</sub> O; 3 h				
28	Pt <sub>1</sub> /ZnO	300 W Xe lamp; batch reactor; 10 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 75 mL H <sub>2</sub> O; 4 h	3 mmol g <sup>-1</sup> h <sup>-1</sup>	65%	14.14 (350 nm)	S27
29	N-TiO <sub>2</sub>	LED lamp; 92 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	23.5 mmol g <sup>-1</sup> h <sup>-1</sup>	90.74%	1.88 (380 nm)	S28
30	q-BiVO <sub>4</sub>	Hg lamp; batch reactor; 170 mW cm <sup>-2</sup> ; 10 mg catalyst; 10 bar CH <sub>4</sub> ; 10 bar O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 7 h	1266 μmol g <sup>-1</sup> h <sup>-1</sup>	86.7%	3.07 (365 nm)	S12
31	Cu <sub>1</sub> -def-WO <sub>3</sub>	LED lamp; batch reactor; 5 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 120 mL H <sub>2</sub> O; 2 h	2489.5 μmol g <sup>-1</sup> h <sup>-1</sup>	96.5%	not reported	S29
32	Ni <sub>1</sub> -NC-TiO <sub>2</sub>	300 W Xe lamp; 450 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 180 mL H <sub>2</sub> O; 4 h	2870 μmol g <sup>-1</sup> h <sup>-1</sup>	53.5%	1.9 (360 nm)	S30
33	UION-Cu(OH)	300 W Xe lamp; batch reactor; 5 mg catalyst; 9 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 5 h	2.75 mmol g <sup>-1</sup> h <sup>-1</sup>	~ 100%	3.52 (375 nm)	S31
34	Zn <sub>4</sub> Fe-400	300 W Xe lamp; batch reactor; 20 mg catalyst; 1 bar 70% CH <sub>4</sub> /Ar; 2 mL H <sub>2</sub> O; 1.5 h	553 μmol g <sup>-1</sup> h <sup>-1</sup>	83%	not reported	S32
35	Ni <sub>0.1</sub> /c-WO <sub>3</sub>	300 W Xe lamp; 170 mW cm <sup>-2</sup> ; batch reactor; 2 mg catalyst; 17 bar CH <sub>4</sub> ; 3 bar O <sub>2</sub> ; 150 mL H <sub>2</sub> O; 24 h	3.27 mmol g <sup>-1</sup> h <sup>-1</sup>	98.2%	1.76 (365 nm)	S33
36	Pt <sub>SAS</sub> -mIn <sub>2</sub> O <sub>3</sub> -x(OH) <sub>y</sub>	LED lamp (365 nm); 30 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 25 bar CH <sub>4</sub> ; 5 bar O <sub>2</sub> ; 150 mL H <sub>2</sub> O; 40 min	10.18 mmol g <sup>-1</sup> h <sup>-1</sup>	84.9%	6.2 (365 nm)	S20
<b>Formic acid</b>						
37	FeN <sub>x</sub> /C	300 W Xe lamp; 150 mW cm <sup>-2</sup> ; batch reactor; 8 mg catalyst; 1 bar CH <sub>4</sub> ; 0.5 mmol H <sub>2</sub> O <sub>2</sub> ; 5 mL H <sub>2</sub> O; 4 h	1165 μmol g <sup>-1</sup> h <sup>-1</sup>	90%	2.76 (500 nm)	S34
38	Pt <sub>NPS</sub> -WO <sub>3</sub>	LED lamp; 60 mW cm <sup>-2</sup> ; flow reactor; 10 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 120 mL H <sub>2</sub> O; 12 h	1.5 mmol g <sup>-1</sup> h <sup>-1</sup>	84%	not reported	S35
39	Fe-POM@PCN	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 1 mg catalyst; 1 bar CH <sub>4</sub> ; 30 μL H <sub>2</sub> O <sub>2</sub> ; 5 mL H <sub>2</sub> O; 13 h	0.45 mmol g <sup>-1</sup> h <sup>-1</sup>	78%	0.18 (360 nm)	S36
40	Pd <sub>NPS</sub> /WO <sub>3</sub>	300 W Xe lamp; 140 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 180 mL H <sub>2</sub> O; 5 h	4.66 mmol g <sup>-1</sup> h <sup>-1</sup>	62%	5.39 (365 nm)	S37
41	TiO <sub>2</sub> -C <sub>3</sub> N <sub>4</sub>	300 W Xe lamp; batch reactor; 20 mg catalyst; 0.67 bar CH <sub>4</sub> ; 0.33 bar O <sub>2</sub> ; 165 μmol H <sub>2</sub> O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 8 h	0.48 mmol g <sup>-1</sup> h <sup>-1</sup>	69.8%	not reported	S38
<b>Ethanol</b>						
42	Cu/PCN	500 W Xe lamp; flow reactor; 20 mg catalyst; 10 mL min <sup>-1</sup> of CH <sub>4</sub> ; 90 mL min <sup>-1</sup> of N <sub>2</sub> ; 25 mL H <sub>2</sub> O; 1 h	106 μmol g <sup>-1</sup> h <sup>-1</sup>	81.2%	not reported	S39
43	CeO <sub>2</sub> @PdO@FeO <sub>x</sub>	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 5 mg catalyst; 19.23 bar CH <sub>4</sub> ; 0.77 bar O <sub>2</sub> ; 10-25 mL H <sub>2</sub> O; 1 h	728 μmol g <sup>-1</sup> h <sup>-1</sup>	95%	not reported	S40
44	Ce-ZnO	300 W Xe lamp; batch reactor; 5 mg catalyst; 9.3 bar CH <sub>4</sub> ; 4.7 bar CO <sub>2</sub> ; 10-25 mL H <sub>2</sub> O; 1 h	580 μmol g <sup>-1</sup> h <sup>-1</sup>	87%	not reported	S41
45	CTF-1	LED lamp; 100 mW cm <sup>-2</sup> ; flow reactor; 1 g	122.4 μmol g <sup>-1</sup>	78.6%	6.9 (365)	S42

		catalyst; 18.9 mmol h <sup>-1</sup> of 20% CH <sub>4</sub> /Ar; 1.2 mmol h <sup>-1</sup> of humidified simulated air (20% O <sub>2</sub> /N <sub>2</sub> ); 4 h	h <sup>-1</sup>		nm)	
46	BiVO <sub>4</sub> @Au	300 W Xe lamp; flow reactor; 5 mg catalyst; 20 bar CH <sub>4</sub> ; 2 bar O <sub>2</sub> ; 10 mL H <sub>2</sub> O; 100 h	680 μmol g <sup>-1</sup> h <sup>-1</sup>	86%	not reported	S43
47	Cu <sub>9</sub> S <sub>5</sub> /Cu-CCN	300 W Xe lamp; 400 mW cm <sup>-2</sup> ; batch reactor; 10 mg catalyst; 19 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 100 mL H <sub>2</sub> O; 1 h	549.7 μmol g <sup>-1</sup> h <sup>-1</sup>	94.8%	0.9 (420 nm)	S44
48	Fe(III)@ACN	Visible light irradiation; 788 mW cm <sup>-2</sup> ; flow reactor; 1 bar CH <sub>4</sub> ; 20 mL H <sub>2</sub> O; 1 h	171.7 μmol g <sup>-1</sup> h <sup>-1</sup>	87%	not reported	S45
49	RCN	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 20 bar CH <sub>4</sub> ; 1 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 3 h	281.6 μmol g <sup>-1</sup> h <sup>-1</sup>	85.1%	not reported	S46
50	CeO <sub>2</sub>	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 2 mg catalyst; 0.2 bar CH <sub>4</sub> ; 15 mL H <sub>2</sub> O; 2 h	11.4 μmol g <sup>-1</sup> h <sup>-1</sup>	91.5%	0.3 (350 nm)	S47
51	Zn–O–Fe(MS)	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 5 mg catalyst; 20 bar CH <sub>4</sub> and O <sub>2</sub> mixture gas (v/v = 25/1); 10 mL H <sub>2</sub> O; 1 h	372 μmol g <sup>-1</sup> h <sup>-1</sup>	67%	not reported	S48
<b>Methyl chloride</b>						
52	Ag <sub>2</sub> O/NTO	Ultraviolet lamps; batch reactor; 10 mg catalyst; 1 bar CH <sub>4</sub> ; NaCl solution; 2 h	152 μmol g <sup>-1</sup> h <sup>-1</sup>	56.5%	7.2 (254 nm)	S49
53	Cu-TiO <sub>2</sub>	300 W Xe lamp; 600 mW cm <sup>-2</sup> ; batch reactor; 100 mg catalyst; 1 bar CH <sub>4</sub> ; NaCl solution; 4 h	17 μmol g <sup>-1</sup> h <sup>-1</sup>	83.7%	5.4 (254 nm)	S50
54	Pt <sub>1</sub> /BiOCl	300 W Xe lamp; batch reactor; 100 mg catalyst; 1 bar CH <sub>4</sub> ; NaCl solution; 2 h	53.4 μmol g <sup>-1</sup> h <sup>-1</sup>	96%	not reported	S51
55	TaO <sub>x</sub> /NaTaO <sub>3</sub>	Ultraviolet lamps; batch reactor; 10 mg catalyst; 1 bar CH <sub>4</sub> ; NaCl solution; 2 h	233 μmol g <sup>-1</sup> h <sup>-1</sup>	83%	10.1 (254 nm)	S52
<b>Acetic acid</b>						
56	(Pt/NPW)/TiO <sub>2</sub>	Hg-Xe arc lamp; batch reactor; 50 mg catalyst; 10 bar CH <sub>4</sub> ; 1 bar CO; 10 mL H <sub>2</sub> O; 60 h	19 μmol g <sup>-1</sup> h <sup>-1</sup>	90%	2.55 (360 nm)	S53
57	PdO/Pd–WO <sub>3</sub>	300 W Xe lamp; 300 mW cm <sup>-2</sup> ; flow reactor; 10 mg catalyst; 1 bar CH <sub>4</sub> ; 10 mL H <sub>2</sub> O; 3 h	1.5 mmol g <sub>Pd</sub> <sup>-1</sup> h <sup>-1</sup>	91.6%	not reported	S54
58	Ag/AgCl-WO <sub>3</sub>	500 W Xe lamp; batch reactor; 20 mg catalyst; 0.5 bar 10%CH <sub>4</sub> /90%N <sub>2</sub> ; 0.5 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 1 h	188.5 μmol g <sup>-1</sup> h <sup>-1</sup>	68%	not reported	S55
59	Rh <sub>1</sub> /pMOF	Solar simulator (AM 1.5G); 100 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 15 bar CH <sub>4</sub> ; 5 bar CO; 4 bar O <sub>2</sub> ; 20 mL H <sub>2</sub> O; 3 h	23.62 mmol g <sup>-1</sup> h <sup>-1</sup>	66.4%	not reported	S56
60	Cu <sub>NPs</sub> /ZnO	Xe lamp; 100 mW cm <sup>-2</sup> ; batch reactor; 20 mg catalyst; 10 bar CH <sub>4</sub> ; 10 bar CO <sub>2</sub> ; 100 mL H <sub>2</sub> O; 2 h	41.16 μmol g <sup>-1</sup> h <sup>-1</sup>	89.5%	not reported	S57
61	Pd/V <sub>o</sub> -WO <sub>3</sub>	300 W Xe lamp; batch reactor; 15 mg catalyst; 0.5 bar CH <sub>4</sub> ; 0.5 bar CO; 15 mL 0.05 M H <sub>2</sub> O <sub>2</sub> ; 3 h	52.7 μmol g <sup>-1</sup> h <sup>-1</sup>	63.7%	not reported	S58
62	RhZn-MoS <sub>2</sub> /TiO <sub>2</sub>	300 W Xe lamp; 1500 mW cm <sup>-2</sup> ; batch reactor; 25 mg catalyst; 5 bar CH <sub>4</sub> ; 11 bar CO; 1 bar O <sub>2</sub> ; 5 mL H <sub>2</sub> O; 5 h	152 μmol g <sup>-1</sup> h <sup>-1</sup>	96.5%	not reported	S59
<b>Acetone</b>						
63	Pd/TiO <sub>2</sub>	300 W Xe lamp; 100 mW cm <sup>-2</sup> ; batch	749 μmol g <sup>-1</sup> h <sup>-1</sup>	82.9%	not	S60

		reactor; 15 mg catalyst; 9 bar CH <sub>4</sub> ; 1 bar CO; 10 mL H <sub>2</sub> O; 150 °C; 3 h			reported	
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## References

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