

Supporting information for manuscript “Ultrafast Photonics Applications Based on Evanescent Field Interactions with 2D Molybdenum Carbide (Mo₂C)”

Shunxiang Liu, Jinsheng Lu, Hongfu Huang, Junle Qu, Qiao Wen*

Table 1. Output performance comparison of mode-locked fibre lasers using various 2D material SAs at a wavelength of 1 μm .

SA type	Pulse width (ps)	Output power (mW)	Pulse energy (nJ)	Slope efficiency (%)	Ref.
Graphene	340	2.1	0.148	NA	1
BP	400	32.5	0.7	7.2	2
Bi ₂ Se ₃	960	1.2	1.08	NA	3
Sb ₂ Te ₃	5.9	4	0.21	NA	4
WS ₂	2500	8.02	2.82	2.45	5
MoS ₂	800	9.3	1.41	NA	6
Ti ₃ C ₂ T _x	480	9	0.47	NA	7
Ti ₂ CT _x	792	11.93	0.72	3.11	8
Mo ₂ C	418	NA	NA	NA	9
Mo ₂ C	350	7.7	0.38	3.7	Our work

Table 2. Output performance comparison of erbium-doped mode-locked fibre lasers based on various 2D material SAs

SA type	Pulse width (fs)	Pulse energy (nJ)	Peak power (W)	Slope efficiency (%)	Ref.
Graphene	756	1.12	1478	3	10
BP	940	1.13	1201	NA	11
Bi ₂ Se ₃	600	0.053	88.2	NA	12
Sb ₂ Te ₃	1800	0.105	58.5	NA	13
WS ₂	21100	0.22	10.4	2.6	14
MoS ₂	710	0.147	207	NA	15
Ti ₃ CNT _x	660	0.003	4.9	NA	16
Ti ₃ C ₂ T _x	159	0.41	2578.6	NA	7
Ti ₂ CT _x	265	1.44	5434	2.02	8
Mo ₂ C	1710	0.48	264	NA	9
Mo ₂ C	313	2.41	7715	10	17
Mo ₂ C	290	0.86	2982	4.1	Our work

References

- 1 S. S. Huang, Y. G. Wang, P. G. Yan, J. Q. Zhao, H. Q. Li and R. Y. Lin, *Opt. Express*, 2014, **22**, 11417-11426.
- 2 H. Song, Q. Wang, Y. Zhang and L. Li, *Optics Communications*, 2017, **394**, 157-160.
- 3 P. G. Yan, R. Y. Lin, H. Chen, H. Zhang, A. J. Liu, H. P. Yang and S. C. Ruan, *IEEE Photonics Technol. Lett.*, 2015, **27**, 264-267.
- 4 M. Kowalczyk, J. Boguslawski, R. Zybala, K. Mars, A. Mikula, G. Sobon and J. Sotor, *Optical Materials Express*, 2016, **6**, 2273-2282.
- 5 H. Guoyu, Y. Song, K. Li, Z. Dou, J. Tian and X. Zhang, *Laser Physics Letters*, 2015, **12**, 125102.

- 6 H. Zhang, S. B. Lu, J. Zheng, J. Du, S. C. Wen, D. Y. Tang and K. P. Loh, *Opt. Express*, 2014, **22**, 7249-7260.
- 7 X. Jiang, S. Liu, W. Liang, S. Luo and Z. Han, *Laser & Photonics Review*, 2018, **12**, 1700229.
- 8 Y. H. Shi, N. Xu and Q. Wen, *J. Lightwave Technol.*, 2020, **38**, 1975-1980.
- 9 M. Tuo, C. Xu, H. Mu, X. Bao, Y. Wang, S. Xiao, W. Ma, L. Li, D. Tang, H. Zhang, M. Premaratne, B. Sun, H.-M. Cheng, S. Li, W. Ren and Q. Bao, *Acs Photonics*, 2018, **5**, 1808-1816.
- 10 Q. L. Bao, H. Zhang, Y. Wang, Z. H. Ni, Y. L. Yan, Z. X. Shen, K. P. Loh and D. Y. Tang, *Adv. Funct. Mater.*, 2009, **19**, 3077-3083.
- 11 Z. C. Luo, M. Liu, Z. N. Guo, X. F. Jiang, A. P. Luo, C. J. Zhao, X. F. Yu, W. C. Xu and H. Zhang, *Opt. Express*, 2015, **23**, 20030.
- 12 Junsu, Lee, Joonhoi, Koo, Young, Min, Jhon, Ju and Han, *Optics express*, 2014, **22**, 6165-6173.
- 13 J. Sotor, G. Sobon, W. Macherzynski, P. Paletko, K. Grodecki and K. M. Abramski, *Optical Materials Express*, 2014, **4**, 1-6.
- 14 D. Mao, S. L. Zhang, Y. D. Wang, X. T. Gan, W. D. Zhang, T. Mei, Y. G. Wang, Y. S. Wang, H. B. Zeng and J. L. Zhao, *Opt. Express*, 2015, **23**, 27509-27519.
- 15 H. Liu, A. P. Luo, F. Z. Wang, R. Tang, M. Liu, Z. C. Luo, W. C. Xu, C. J. Zhao and H. Zhang, *Opt. Lett.*, 2014, **39**, 4591-4594.
- 16 Y. I. Jhon, J. Koo, B. Anasori, M. Seo, J. H. Lee, Y. Gogotsi and Y. M. Jhon, *Adv. Mater.*, 2017, **29**, 1702496.
- 17 S. Liu, Y. Wang, R. Lv, J. Wang, H. Wang, Y. Wang and L. Duan, *Nanophotonics*, 2020, **9**, 2523-2530.