

Construction of environmentally durable, flame-retardant, and superhydrophobic melamine sponge functionalized with PDA and OTS for efficient oil-water separation

Teng Chen ^a, Yunjiang Wo ^a, Xin Li ^a, Fei Yu ^b, Wenwei Tang ^a, Jie Yang ^a, Fayin Ju ^c, Kai He ^c,
Ning Li ^{c*}, Zhaojian Gao ^{b*}

^a School of Material and Chemical Engineering, Xuzhou University of Technology, Xuzhou,
221018, People's Republic of China;

^b School of Food and Biological Engineering, Xuzhou University of Technology, Xuzhou, 221018,
People's Republic of China;

^c Jiangsu Youzhong Micri-nano Semiconductor Technology Co., Ltd, Nantong, 226300, People's
Republic of China

*Corresponding author: ln@youzhong.tech (Ning Li); gaozhaojian@126.com (Zhaojian Gao)

Tab. S1 Comparison of catalytic activity by various catalysts for the reduction of MB dye pollutants

Materials	absorption capacity (g/g)	Ref
PBa-PD@MS _{4.0%}	15.6-43.0	(1)
PDMS-SiO ₂ @ZIF-8@MS	58.5-114.3	(2)
PDMS@COF@MS	24-58	(3)
SA/Fe ₃ O ₄ @PCA/MS	73.8-152.4	(4)
TEHFDS-MNPs/melamine sponge	39.8 -78.7	(5)
octadecylchlorosilane/melamine sponge	45-65	(6)
S-MMP@MS	54.3-136.7	(7)
GA-Fe-HT melamine sponge	65-105	(8)
OTS@PDA@MS	40.14-130.43	This work

Reference:

- (1) M. X. Leng, T. Y. Ou, H. R. Huang, J. X. Li, J. X. He, X. M. Su, M. Xiao, H. Jia and C. X. Zhao, *Colloid. Surf. A.*, 2026, **729**, 138837.
- (2) W. X. Zu, X. Y. Shao, M. J. Sun, Y. Sun, Z. Liu, X. H. He, T. H. Zhou, S. J. Wang and X. J. Zhang, *J. Environ. Chem. Eng.*, 2025, **13**, 120192.
- (3) Y. Y. Wang, T. P. Jiang, W. J. Wei, L. L. Zeng, J. J. He, S. Chen, J. Y. Tang and Z. W. Gao, *J. Environ. Chem. Eng.*, 2025, **13**, 119872.
- (4) L. Chen, Y. K. Guo, P. Y. Cui, Z. X. Lin, J. L. Yao, S. A. R. Naqvi, Y. M. Sun and Y. N. Guo, *Colloid. Surfaces A.*, 2025, **726**, 137889.
- (5) Z. T. Li, H. T. Wu, W. Y. Chen, F. A. He and D. H. Li, *Sep. Purif. Technol.*, 2019, **212**, 40-50.
- (6) Q. P. Ke, Y. X. Jin, P. Jiang and J. Yu, *Langmuir*, 2014, **44**, 13137-13142.
- (7) J. W. Ji, Q. Jia and R. Y. Chen, *ACS Appl. Polym. Mater.*, 2024, **9**, 5287-5296.
- (8) L. P. Ding, M. Chen, H. Y. Lu, H. C. He, X. Liu and Y. Q. Wang, *Prog. Org. Coat.*, 2021, **151**, 106075.

