

# Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene/polyaniline (PANI) sandwich intercalation structure composites constructed for microwave absorption

Huawei Wei<sup>1</sup>, Jidong Dong<sup>1</sup>, Xiaojiao Fang<sup>1</sup>, Wenhui Zheng<sup>1</sup>, Yutong Sun<sup>1</sup>, Yue Qian<sup>1</sup>,  
Zaixing Jiang<sup>1</sup>, Yudong Huang<sup>1</sup>

<sup>1</sup> *MIIT Key Laboratory of Critical Materials Technology for New Energy Conversion and Storage, State Key Laboratory of Urban Water Resource and Environment, School of Chemistry and Chemical Engineering, Harbin Institute of Technology, Harbin 150001, People's Republic of China.*  
weihuawei1993@163.com

MXene, as a new kind of 2-dimensional (2D) material, has excellently potential applications in the field of electrochemistry owing to its high conductivity and large charge transporting speed. Especially, MXene/polymer composites have attracted widely attentions due to their extensively application in the area of multi-functional materials. Here, the Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene/polyaniline (PANI) composites with different PANI content have been successfully prepared, and the microwave absorption mechanism of these materials is investigated. Attributed to the multiple layer structure, dielectric property of Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene and PANI, and the synergistic effect between the Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> and PANI, the as-prepared composites possess a specific microwave absorbing behavior. With a proper content of PANI, the MXene/PANI composites in a paraffin matrix exhibit a maximum reflection loss of -56.30 dB at 13.80 GHz with the thickness of 1.8mm. And the effective absorption bandwidth (>90%) ranges from X-band (8~12.4 GHz) to Ku-band (12.4~18 GHz) with the tunable thickness from 1.5~2.6mm. The results indicate that MXene/PANI composites, as great potential candidates, can be used in the field of microwave absorption.

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