

POLYMER COMPOSITE COATINGS BASED ON 2D MXENE

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MXenes is the currently one of the most studied classes of two-dimensional materials over the past decade for their unique physicochemical properties and broad application potential¹. Specifically, the understanding and development of $\text{Ti}_3\text{C}_2\text{T}_x$ -based surface coatings with deicing functionality are of big interest for applications in aerospace², transportation³, renewable energy systems⁴, and critical infrastructure⁵.

This study focuses on the development of MXene-based composite coating for aerospace applications, with the aim of improving deicing performance while maintaining the durability and functionality required for outdoor environments.

2D delaminated $\text{Ti}_3\text{C}_2\text{T}_x$ MXene have been prepared by in-situ delamination hydrothermal method. This new method provides high-yield of delaminated $\text{Ti}_3\text{C}_2\text{T}_x$ MXene, which is up to eight times faster than conventional routes as e.g., MILD method. Polymer coating based on acrylate formulations and epoxy systems with 2D $\text{Ti}_3\text{C}_2\text{T}_x$ MXene were prepared. The polymer/MXene films were characterised using TGA, Four-Probe, AFM, XPS and mechanical methods.

References

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