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Abstract

MXene as two dimensional (2-D) Titanium (III) Carbide (II) ($Ti_3C_2T_x$) nanosheets was synthesized and processed by etching bulk MAX phase Titanium (III) Aluminium Carbide (II) (Ti_3AlC_2) powders in HF solution. This material demonstrated an extraordinary efficiency for the removal of barium from synthetic produced/co-produced water. The synthesized nanosheet was characterized using field emission scanning electron microscopy (FE-SEM), the Brunauer Emmett and Teller (BET) nitrogen surface area adsorption, X-ray photoelectron spectroscopy (XPS), X-ray diffraction (XRD), particle size analysis and Zeta potential. The effect of adsorption parameters such as adsorbent dosage, contact time, and initial barium concentration were investigated and the optimum parameters for maximum removal of barium have been investigated. The experimental adsorption equilibrium data were correlated by the Langmuir and

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