Hybrid Fe$_3$O$_4$/MOFs for the adsorption of methylene blue and methyl violet from aqueous solution

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ABSTRACT

The adsorptions of methylene blue (MB) and methyl violet (MV) from an aqueous solution of Fe$_3$O$_4$/metal-organic frameworks (MOFs) composite were studied in view of the adsorption isotherm, kinetics and regenerate of the sorbent. The adsorption isotherms of MB and MV on Fe$_3$O$_4$/MOFs composite both followed the Langmuir isotherm. Adsorption kinetics were determined from the experimental data. The used Fe$_3$O$_4$/MOFs could be regenerated by acetonitrile, so it can be recycled for use. The excellent adsorption effect and reusability make Fe$_3$O$_4$/MOFs attractive for the removal of MB and MV from aqueous solution. The feasibility of Fe$_3$O$_4$/MOFs for application in magnetic solid-phase extraction was examined.

Keywords: Fe$_3$O$_4$/MOFs; Methylene blue; Methyl violet; Adsorption; Determination