

## Study the Performance of Metal-Organic Framework in Adsorptive Desulfurization for Gas Oil

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**Abstract :** Organic sulfurs in fuel oil cause serious environmental pollution and health problems. The important future direction for liquid fuel desulfurization is adsorptive desulfurization technology due to its simplicity, mild operating condition, and low cost. In this work, the well-prepared Nickel NPs were incorporated in a highly porous metal-organic framework MIL-101(Cr)) to produce Ni/Cr-MOF composite. Besides, the synthesis of Ni/Cr-MOF in the presence of Bi<sub>2</sub>MoO<sub>6</sub>/AC to prepare Bi<sub>2</sub>MoO<sub>6</sub>/AC@Ni/Cr-MOF. All the prepared composites were synthesized via a facile technique under ambient conditions to remove organosulfur compounds. The XRD, FT-IR, SEM, and BET techniques were used to characterize the prepared composites. The desulfurization performance of real gas oil by Bi<sub>2</sub>MoO<sub>6</sub>/AC, Ni/Cr-MOF, and Bi<sub>2</sub>MoO<sub>6</sub>/AC@Ni/Cr-MOF was investigated at different adsorbent doses and contact times. Bi<sub>2</sub>MoO<sub>6</sub>/AC@Ni/Cr-MOF shows the highest desulfurization performance, with removal efficiency reached to 80% at optimum conditions for a contact time of 4 hours.

**Keywords :** desulfurization, gas oil, metal-organic framework, sorption characteristics

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