

Graduate School
Faculty of Science
Department of Chemistry

**The Thesis Submitted for the Degree of Master of Science
(In the field of Analytical Chemistry)**

**Functionized cerium-based metal-organic framework
for methyl orange removal from aqueous solutions**

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Abstract

In this research, a porous organic polymer based on cerium along with a metal-organic framework is investigated as an adsorbent for the extraction of methyl orange dye from aqueous medium. Some methyl orange is added to the aqueous solution, then it is extracted by an adsorbent and its analysis is performed by an ultraviolet-visible spectrophotometer. Some effective factors on extraction such as pH, adsorbent amount, detergent volume and adsorbent contact time are optimized and studied. pH is equal to 6, stirring time is 30 minutes, amount of adsorbent is 10 mg and the conditions are optimal. Under these conditions, the detection limit was 0.6 $\mu\text{g/liter}$. Then, under optimal conditions, this method was used to determine the amount of methyl orange color removal in real samples.

Keywords: Metal-organic framework, porous organic polymer, methyl orange color



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