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Metal-Organic Framework modification by laser irradiation

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Introduction. Metal-organic frameworks (MOFs) are a class of materials that have unique structural and chemical properties and have attracted significant attention in various fields [1]. In recent years, there has been growing interest in studying the effects of the MOFs laser modification. Laser irradiation can cause various changes in the optical and structural properties of MOFs, including changes in their transmission and reflection. However, the laser parameters that can lead to modification of the crystalline structure of MOFs are not yet fully understood. In this study, we aim to investigate the effects of laser irradiation on MOFs and to identify the laser parameters that can modify their crystalline structure.

Main Part. The study aims to provide valuable insights into the behavior of MOFs under laser irradiation, including the effects of different laser parameters on their optical and structural properties. By analyzing the changes in transmission and reflection of light through the MOF samples using a spectrophotometer-microscope, the study hopes to identify the specific laser parameters that can lead to modification of the MOFs' crystalline structure [2].

In addition, the study seeks to determine the ablation and modification thresholds of the MOFs under laser irradiation. Ablation threshold refers to the laser parameters required to remove material from the surface of the MOF samples, while the modification threshold indicates the laser parameters required to modify the MOF material without causing any significant removal [3].

Furthermore, the study compares the laser modification of the MOF structure by ns (nanosecond) and fs (femtosecond) pulses. This comparison can provide valuable insights into the optimal laser parameters required to modify MOFs for different applications [3].

Overall, the study aims to contribute to the growing body of knowledge on the behavior of MOFs under laser irradiation, potentially opening new avenues for modifying the properties of MOFs using laser irradiation in various applications.

Conclusion. This study has provided valuable information about the effects of laser irradiation on metal-organic frameworks (MOFs), including the identification of laser parameters that can modify the MOFs' crystalline structure and the determination of the ablation and modification thresholds. Future work in this field can explore the use of laser irradiation on MOFs with different structures and chemical compositions, providing new avenues for modifying the properties of MOFs using laser irradiation. Overall, this study contributes to the growing body of knowledge on the behavior of MOFs under laser irradiation and their potential applications.

References.

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