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阴离子粘土(LDH)对DNA吸附行为的研究 DNA adsorption behavior of layered double hydroxides

关键词: [阴离子粘土](#) [DNA](#) [吸附](#)

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摘要: 以4种阴离子粘土做吸附剂,研究了阴离子粘土对DNA的吸附行为.同时,采用XRD、FTIR、UV-vis等表征手段对吸附前后的材料进行研究.吸附结果显示,二元阴离子粘土对DNA的吸附量高于三元阴离子粘土;3:1型阴离子粘土对DNA吸附力强于2:1型阴离子粘土.4种材料对DNA的吸附均符合Langmuir、Freundlich两种吸附等温模型,且Langmuir吸附等温模型拟合度更高,说明阴离子粘土对DNA的吸附为单层吸附.XRD结果显示,吸附前后阴离子粘土基本结构并未发生改变,晶形完好,层间距未有明显变化,表明阴离子粘土对DNA的吸附仅发生在表面,DNA并未进入阴离子粘土层间结构中.UV-vis及电泳结果显示,吸附前后DNA的构型并未发生改变,阴离子粘土的吸附并未对DNA产生较大的影响.

Abstract: Four different layered double hydroxides (LDHs) were prepared as adsorbents for DNA adsorption. X-ray diffraction (XRD) spectra, Fourier transform infrared (FTIR) spectra and UV-vis spectra were carried out to characterize the adsorption mechanism of DNA on four LDHs. The results showed that the adsorption capacities of binary LDHs were higher than ternary LDHs, and 3:1 LDHs adsorbed more DNA than 2:1 LDHs. The adsorption data were analyzed by both Freundlich and Langmuir isotherm models. The data were better fitted by the Langmuir isotherm model, suggesting that DNA molecules were likely to form monomolecular layer on the surface of LDHs. XRD results revealed that the basic structure and interlamellar spacing of LDHs did not change, indicating that DNA did not significantly intercalate into the LDHs. Meanwhile, UV-vis spectra and agarose electrophoresis provided the evidences that LDHs had little influence on the structure of DNA during the adsorption process.

Key words: [layered double hydroxides](#) [DNA](#) [adsorption](#)

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