

载铜蒙脱石对嗜水气单胞菌的吸附研究

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摘要 以钙基蒙脱石、钠基蒙脱石、

酸活化蒙脱石为原料制备了载铜蒙脱石并研究它们对嗜水气单胞菌的吸附性能。

蒙脱石和嗜水气单胞菌的Zeta电位随pH值升高而降低; 载铜蒙脱石的Zeta电位随pH值升高而增大, 当pH=4~6时Zeta电位从负值转变为正值。酸活化蒙脱石、钠基蒙脱石和钙基蒙脱石对细菌的平衡吸附率分别为36.5%、20.1%和14.3%, 其相应的载铜蒙脱石对细菌的平衡吸附率分别为99.6%、93.1%和87.4%。

蒙脱石对细菌的吸附率随着pH的增加而减小, 载铜蒙脱石对细菌的吸附率先随pH值的增大而减小, 到pH=5.0

后随pH值的增大而增大。载铜蒙脱石Cu²⁺脱附实验表明, 经过脱附后的沉淀物基本保持着原来的吸附活性,

而经过脱附后的上清液对细菌的吸附率很低。载铜蒙脱石的抗菌作用是静电吸附细菌与铜离子抗菌的综合作用。

关键词 [蒙脱石](#) [载铜蒙脱石](#) [嗜水气单胞菌](#) [吸附](#)

分类号 [TD985](#) [X172](#) [TQ445](#)

Adsorption of Aeromonas Hydrophila by Copper-bearing Montmorillonite Clays

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Abstract Calcium montmorillonite (Ca-MMT), sodium ontmorillonite (Na-MMT) and acid-activated montmorillonite (AAM), and their Cu²⁺-exchanged ontmorillonites (Cu-MMT), Cu*Ca-MMT, Cu*Na-MMT and Cu*AAM, were used to study the adsorptive activity on Aeromonas hydrophila. The Zeta potentials of MMTs and A. hydrophila are all decreased with increasing pH, and those of Cu-MMTs are increased with increasing pH and transformed from the negative to positive value when pH=4--6. AAM, Na-MMT and Ca-MMT show some ability to reduce bacterial plate counts by 36.5%, 20.1% and 14.3%, respectively. The Cu*AAM, Cu*Na-MMT and Cu*Ca-MMT reduce the bacterial plate counts by 99.6%, 93.1% and 87.4%. The extent of bacterial adsorption onto MMTs is decreased with increasing pH. However, the bacterial adsorption onto Cu-MMTs is decreased with increasing pH and increased with increasing pH when pH>5.0. The study of desorption of Cu²⁺ by washing with physiological saline for 24h reveals that the washing solutions don't show a significant reduction of the bacterial counts, while the washed Cu-MMTs retain their full antibacterial activity. The mechanism by which bacterial counts are reduced may involve the enhanced affinity of Cu-MMT for Aeromonas hydrophila and the antibacterial activity of Cu²⁺.

Key words [montmorillonite](#) [copper-bearing montmorillonite](#) [aeromonas hydrophila](#) [adsorption](#)

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