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五氯苯酚对厌氧颗粒污泥微生物的毒性作用

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摘 要: 通过间歇培养方式研究了五氯苯酚对上流式厌氧污泥床和厌氧膨胀颗粒床反应器厌氧颗粒污泥微生物的毒性作用. 结果表明: 五氯苯酚对厌氧颗粒污泥中微生物有较强的毒性; 低浓度PCP对厌氧颗粒污泥中微生物辅酶F420含量、磷酸酯酶活性以及胞外多聚物的分泌都有抑制作用, 高浓度PCP则直接杀死菌体; PCP对厌氧颗粒污泥中不同微生物活性有不同的抑制作用, 对利用乙酸的甲烷菌和利用丙酸和丁酸的产氢产乙酸菌都有强烈的抑制作用; EGSB反应器厌氧颗粒污泥对PCP的抑制有更强的耐受能力.

关键字: 五氯苯酚; 毒性; 厌氧颗粒; 污泥; 活性

Toxicity of pentachlorophenol to microorganisms of anaerobic granular sludge

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Abstract: A series of batch cultures are conducted to assess the toxicity of pentachlorophenol(PCP)to microorganisms of anaerobic granular sludges from Up flow Anaerobic Sludge Bed and Expanded Granular Sludge Blanket reactors. The results show that PCP has strong toxicity to methanogenic activity of sludges. Lower concentration of PCP inhibites coenzyme F420and phosphatase activity, as well as secretion of extracellular polymers in anaerobic granular sludges. Higher concentration of PCP kills the anaerobes. Acetate-utilizing methanogens and hydrogen-producing acetogenic bacteria that use propionate and butyrate suffer much higher inhibition from PCP. Sludge from Expanded Granular Sludge Blanket reactor can bear higher concentration of PCP than sludge from Up flow Anaerobic Sludge Bed reactor.

Key words: pentachlorophenol; toxicity; anaerobic granular; sludge; activity

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