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生物活性炭(PACT)对印染废水A²/O工艺强化运行效果的表征

Characterization of improved performance by powdered active carbon treatment (PACT) for dyeing wastewater treatment using A²/O process

关键词: [PACT工艺](#); [A²/O工艺](#) [生物强化](#); [生物载体](#)

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摘要: 采用A²/O (PACT) 工艺处理水解酸化后的印染废水, 对其生物强化效果进行了表征. 结果表明: 在粉末活性炭投加量为100 mg · L⁻¹的条件下, 对比A²/O工艺, A²/O (PACT) 对COD的去除率提升超过10%, 其处理能力可以达到0.6~1.0 kg · kg⁻¹活性炭, 有效提升了系统的冬季运行效果. GC-MS、毒性表征结果表明, A²/O (PACT) 针对苯环类、稠环类、杂环类等特征有机污染物具有更好的处理效果. 紫外-可见光光谱以及分子量分布检测结果表明: A²/O (PACT) 对大分子物质 (染料类、腐殖类显色物质等, 800~1000 Da) 的去除有较为明显的促进效果. 此外, 针对污泥的镜检发现, A²/O (PACT) 活性污泥中具备更加完整的生物相, SEM检测结果也表明, PACT系统中粉末活性炭的生物载体作用明显.

Abstract: The improved performance of A²/O(PACT) technology is characterized in comparison with conventional A²/O process in treatment of dyeing wastewater after hydrolysis acidification. The result shows that COD removal increased over 10% in A²/O(PACT) under a certain dosing quantity (100 mg · L⁻¹) of powdered active carbon (PAC), while the experimental result demonstrates that treatment capacity of A²/O(PACT) could reach 0.6~1.0 kg · kg⁻¹ PAC, and its operating efficiency and stability is greatly improved in winter. In addition, A²/O(PACT) process exhibits a higher removal efficiency in aromatic-, polycyclic-and heterocyclic-compounds characterized by GC-MS. The treatment performance for macro-molecular substance (e.g. dyestuff and humus with molecular weight of 800~1000 Da) is also improved by A²/O(PACT) detected by UV-VIS spectrometer and Gel permeation chromatography. Meanwhile, microscopic examination and electronic microscope photograph analysis show that A²/O(PACT) has a more complete biological biofacies, and the enhancement of PACT process could be attributed to the biological carrier role of the PAC.

Key words: [PACT process](#) [A²/O process](#) [bioaugmentation](#) [biological carrier](#)

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