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絮凝过程中絮体生长的多重分形行为 

Multifractal behavior of flocs growth in flocculation processes

关键词: [絮凝](#) [多重分形](#) [絮体](#)

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摘要: 为了研究絮体在絮凝过程中生长的多重分形行为, 对用PFS(聚合硫酸铁)处理高岭土原水时混凝过程中絮体生长段的絮体图像进行采集和分析; 分析图像多重分形谱及其特征参数行进趋势, 而且针对絮体生长规律着重对絮体形态及其分布的演变情况进行了定量化描述. 结果表明, 随着絮体生长的进行, 多重分形谱图的形态由左钩状逐渐转变为右钩状, 描述絮体分布均匀性的多重分形谱谱宽 $\Delta\alpha$ 由50 s时的1.0213逐渐增大至250 s时的1.3659, $\Delta f(\alpha)$ 的数值大小由于大概率和小概率絮体主导地位的改变而由负转正, $f(\alpha)_{\max}$ 所表示的简单分形维数由1.9995逐渐降至1.7762.

Abstract. The multifractal behavior of flocs in flocculation processes is studied in this paper. In the coagulation process treating raw water in the form of kaolin suspension with PFS, the flocs images in growth phases were collected and analyzed. The variation trend of the multifractal spectrum of images and its characteristic parameters were analyzed, and the flocs growth regular pattern with the emphasis on the flocs morphology and their distribution variation pattern were quantitatively described. It was concluded from the result that with the growth of flocs, the spectrum gradually shifted from left hook shape to right one, and the spectrum width $\Delta\alpha$ which describes uniformity of flocs distribution increased gradually from 1.0213 at 50 s to 1.3659 at 250s, and the magnitude of $\Delta f(\alpha)$ was turned from negative to positive. $f(\alpha)_{\max}$ that represents simple fractal gradually fell from 1.9995 to 1.7762.

Key words. [flocculation](#) [multifractal](#) [floc](#)

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