Behaviour of the X-ray contrast agent iopamidol during anaerobic treatment and effect on biogas production

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**ABSTRACT**

Among the iodinated contrast media, iopamidol (IOPA) has been frequently detected in effluents of wastewater treatment plants and surface waters at elevated concentrations due to their refractory nature and hence incomplete removal. The objective of this study was to investigate anaerobic treatability of aqueous IOPA and its effect on biogas production in lab-scale batch reactors treating synthetic sewage. Initial total COD (COD\(_{\text{tot}}\)) concentrations varied between 800–950 mg/L in the batch reactors having IOPA concentrations in the range of 0–100 mg/L. Findings of this study reflected that increased IOPA concentrations did not result in any significant decrease in anaerobic treatment performance as well as the biogas yield. Although the highest soluble COD (COD\(_{\text{sol}}\)) removal was observed in the bioreactor bearing no IOPA (i.e., 90% COD\(_{\text{sol}}\)), no meaningful change occurred at elevated IOPA concentrations up to 100 mg/L (i.e., 82% COD\(_{\text{sol}}\)). Results also indicated that IOPA could be removed from the supernatant at a rate of 33–44% at the end of a 32-day incubation period. Moreover, maximum cumulative biogas production was observed as 134 mL in the reactor with 75 mg/L IOPA compared to 111 mL in the control reactor.

**Keywords:** Anaerobic treatment; Biogas; Inhibition; Iopamidol; X-ray contrast agent

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