

Evaluation of odour intensity from activated sludge based sewage treatment works

Baisali Rajbansi^a, Ujjaini Sarkar^{b*}

^aDepartment of Chemical Engineering, Calcutta Institute of Technology, Uluberia, Banitabla, Howrah, West Bengal 711316, India
email: baisali_rajbansi@rediffmail.com

^bDepartment of Chemical Engineering, Jadavpur University, Jadavpur, Kolkata-700032, West Bengal, India
Tel. +91 (33) 24146378; Fax +91 (33) 24146378; email: usarkar@chemical.jdpu.ac.in, abhi_nandan47@rediffmail.com

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ABSTRACT

The objective of this work was to develop a relationship between odour intensity and sewage concentration by using data collected from various sensitive areas of an activated sludge based sewage treatment plant at Titagarh, near Kolkata, India. A number of well-known psychophysical models (e.g., Weber–Fechner law, Steven’s power law, Beidler’s and Laffort’s models) that can successfully relate the perceived intensity with the sewage concentration have been discussed. Respective parameters for each of the models were estimated by the nonlinear Levenburg–Marquardt parameter estimation method. The overall performance of the model was tested statistically against sets of data from the panel method analysis. The model based on the Weber–Fechner law was ranked 1 in the case of three out of eight samples and it was found more representative of the more intense odour samples. The model based on power law equation represented the intensity–concentration relationship better with extremely low uncertainties on both parameters k_1 and k_2 for comparatively less intense odour samples. Only 1 sample out of the 8 samples based on Beidler’s model was found more representative for the high intense sewage samples.

Keywords: Odour intensity; Sewage; Activated sludge; Non-linear least square; Uncertainties

* Corresponding author.