



A model to determine oxygen mass transfer coefficient in bioreactors

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Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | The objective of this paper is to present an experimentally validated mechanistic model to predict the oxygen transfer rate coefficient (K_{La}) in aeration tanks for different water temperatures. Using experimental data created by Hunter and Vogelaar, the formula precisely reproduces experimental results for the standardized K_{La} at 20 °C, comparatively better than the current model used by ASCE 2-06 based on the equation $K_{La20} = K_{La} \cdot (20 - T)^n$ where T is in °C. Currently, reported values for range from 1.008 to 1.047. Because it is a geometric function, large error can result if an incorrect value of n is used. Establishment of such value for an aeration system can only be made by means of series of full scale testing over a range of temperatures required. The new model predicts oxygen transfer coefficients to within 1% error compared to observed measurements. This is a breakthrough since the correct prediction of the volumetric mass transfer coefficient (K_{La}) is a crucial step in the design, operation and scale up of bioreactors including wastewater treatment plant aeration tanks, and the equation developed allows doing so without resorting to multiple full scale testings. | Format: Paperback |...

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