

Modeling surface gas transfer in agitated vessels using Computational Fluid Dynamics.

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Abstract:

Surface gas transfer into agitated vessels is an important phenomenon in many industries applications. This work focuses on the development of a novel approach to model surface gas transfer using computational fluid dynamics (CFD). The methodology was developed to understand oxygen-water surface transfer in agitated vessels. Experimental data in the form of dissolved oxygen (DO) curves were used to verify the modeling approach. To increase computational efficiency, a species transport model was used as an alternative to more traditional multiphase approaches. DO profiles and kLa 's obtained from CFD models were comparable to experimental data for a range of tank scales and designs. This approach provides an efficient way to design vessels with specific kLa requirements using CFD and thus reducing the cost of experimentation.

(124 words in the abstract)