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# Mass transport and energy consumption inside a lithium electrolysis cell

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## Abstract

Mass transfer and energy consumption of a lithium electrolysis cell, called gas-lift cell, is investigated with a developed solver in open source package, OpenFOAM. The velocity distribution introduced by the bubbles, is solved by an Euler-Euler two-phase flow model, while the k-epsilon approach is used to solve the electrolyte turbulent flow. The non-uniform distribution of the bubbles and the gas coverage at the anode are influenced by the current density distribution. Infact, the electric and flow fields assumed to be weekly coupled. Moreover, the strong dependence between the potential field, current distribution, and ions concentration is taken into account. The solver is developed and validated, considering the strong coupling between different phenomena inside of the cell and at its boundaries. This model is general and can be used for the simulation of the concentration and electric fields inside any electrolysis cell.

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