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Oxygen Transfer in Viscous Non-Newtonian Liquid in a Hybrid Bioreactor

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Abstract : Global oxygen transfer coefficient (kLa) was characterized in a mechanically agitated airlift bio reactor. The experiments were carried out in an airlift bio reactor (3.2 L) with internal re circulation (a concentric draft-tube airlift vessel device); the agitation is carried out through a turbine Rushton impeller located along with the gas sparger in the region comprised in the riser. The experiments were conducted using xanthan gum (0.6%) at 250 C and a constant rotation velocity of 0 and 800 rpm, as well as in the absence of agitation (airlift mode); the superficial gas velocity varied from 0.0157 to 0.0262 ms-1. The volumetric oxygen transfer coefficient dependence of the rotational speed revealed that the presence of agitation increased up to two times the kLa value.

Keywords : aeration, mass transfer, non-Newtonian fluids, stirred airlift bioreactor
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