EFFECTS OF ADDING PROPAOL AND CARBOXY METHYL CELLULOSE (CMC) ON MIXING TIME AND MASS TRANSFER COEFFICIENT IN AIR LIFT LOOP REACTOR

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Abstract

The effects of superficial gas in the riser ($V_{gs}$) and liquid phase properties on the mass transfer coefficient ($K_{La}$) and mixing time ($T_{m}$) were studied in 8 liter internal air lift loop reactor (down comer-to-riser cross-sectional area ratio = 0.249). Air was used as a gas phase. Water, 10% concentration of the propanol aqueous solution was used as Newtonian liquid and 2% of carboxyl methyl cellulose solution (CMC) was used as non-Newtonian liquid. Superficial gas velocity varied from 0.01 m/s to 0.1 m/s and air is dispersed into the center of the base of the riser by using a porous gas distributor. The experimental result shows that the water- isopropanol system can significantly enhance gas holdup and increased the volumetric mass transfer coefficient to reach the double that value in pure water and ($T_{m}$) generally declined with increased flow rates of gas. The value of ($K_{La}$) in the (CMC) solution is approximately similar to that for water and ($T_{m}$) decreases with increases gas velocity.

Keywords: Airlift reactor; Mass transfer; mixing time; Liquid-phase properties