

Spectral analysis for hydrodynamic and gas-liquid mass transfer in a bubble column: Effect of non – coalescing system.

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Abstract

Spectral analysis and statistical studies were investigated in a semi pilot bubble column using wall pressure sensors in different axial position both in the air–water system and in water–alcohol solutions (ethanol, 2-propanol and 1-butanol). Gas holdup is more important in the zone far enough to the gas distributor. Then volumetric mass transfer coefficient (KLa) was measured for three axial positions. Interesting results show clearly by the average frequency, that regime transition is delayed for the coalescence inhibitor system and more particularly with the increase in the carbon number of the alcohol. Cross correlation and coherence between two pressure sensors signals revealed clearly that the transition of the flow regime starts when the periodicity appears for a certain gas velocity. The results of the gas liquid mass transfer revealed that KLa decreased with addition of alcohol which is explained by Higbie's theory.

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