

STUDIES ON MIXING DURING START-UP OF INVERSE TURBULENT FLUIDISED BED REACTOR

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ABSTRACT

Quite recently the gas-liquid-solid fluidised has gained increasing importance in the area of biotechnology, particularly in fermentations and waste water treatment, because they provide favourable mixing and mass transfer properties combined with low shear stressing of the biological material. Even though many studies have been conducted in gas-liquid-solid mixing with liquid recirculation, there are not many studies conducted to study the start-up of this system. The sequential mixing at the start-up of fluidised bed anaerobic reactors play an important role since the biofilm infrastructure is continuously under development and evolution. The objective of the present study was to study the influence of gas sparger system on mixing in gas-liquid-solid fluidised bed start-up, without liquid recirculation, for different percentages of carrier fill in the reactor. It was found that the effect of sparger type, had great influence, on fluidisation of bed with increase in mass of the solids in the reactor. The study has helped in establishing, possible fluidisation of a higher mass of solids with perforated plate and also the effect of sparger on axial dispersion coefficients.

KEY WORDS: Fluidised bed, Start-up, Perforated gas sparger, Membrane gas sparger, Low density carrier