

Abstract

- Proposed is a cylindrical reactor (1) having a vertical longitudinal axis for continuous hydroformylation of a C₆-C₂₀-olefin or a mixture of C₆-C₂₀-olefins with synthesis gas in the presence of a homogeneously dissolved metal carbonyl complex catalyst,
- having a multiplicity of Field tubes (2) which are oriented parallel to the longitudinal axis of the reactor (1) and welded into a tube plate at the upper end of the reactor (1),
 - having a circulation tube (3) open at both ends which envelops the Field tubes (2) and at its lower end projects beyond said tubes,
 - having a jet nozzle (4) at the bottom of the reactor (1) for injecting the reactant mixture comprising the C₆-C₂₀-olefin, the synthesis gas and the metal carbonyl complex catalyst, wherein
 - the Field tubes (2) are configured in terms of their number and their dimensions such that
 - the total heat exchanger area of said tubes per unit internal volume of the reactor is in the range from 1 m²/m³ to 11 m²/m³ and
 - the cross sectional area occupied by the Field tubes (2) per unit cross sectional area of the circulation tube (3) is in the range from 0.03 m²/m² to 0.30 m²/m²,
 - a gas distributor ring (5) is provided at the lower end of the circulation tube (3), at the inner wall thereof, via which a substream of the synthesis gas is feedable, and wherein
 - one or more distributor trays (6) are provided in the circulation tube (3).

(Figure 1)