BIOCHEMICAL REACTIONS AND OXYGEN TRANSFER INTO DIFFERENT FERMENTATION BROTHS AND REACTORS

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1 INTRODUCTION

Few biochemical reaction systems are known which are thoroughly analysed. Since in the author's laboratory detailed investigations have been carried out in tower loop reactors, only these reactors will be considered here.

Four different tower loop reactor types were used for the investigations: Two concurrent air lift tower loop systems (a single-stage and a ten-stage reactor) and two countercurrent tower loop systems (a single-stage and a three-stage reactor).

A stainless steel single-stage concurrent bubble column air lift loop reactor, 15 cm in diameter, with a bubbling layer, 275 cm high, and a stainless steel porous plate were used for the cultivation of Hansenula polymorpha (1) and Escherichia coli (2) (Fig. 1)

The same tower was also used as a ten-stage reactor. Nine perforated plates were installed, which separated the tower into 10 sections (Fig. 2). Each of the perforated plates had holes, 3 mm in diameter, and a relative free cross-sectional area of 6.5%. E. coli was cultivated in this reactor (2).

A stainless steel, 254 cm high countercurrent tower loop reactor, 20 cm in diameter, was operated in a single- or three-stage mode (3) (Fig. 3).
Fig. 1 Schematic view of the single-stage concurrent (air lift) tower loop reactor (Reactor A)