Abstract
Growth of an extremely thermophilic archaeon, Pyrococcus woesei, at 90C in a 2–1 fermentor was significantly enhanced by gassing with N2/CO2 (95%/5%). Both growth and -amylase activity were also positively influenced by increasing the agitation speed up to 1200 rpm under continuous gassing at 0.2 vvm. However, increasing the agitation speed to 2400 rpm led to decreases in the maximum cell concentration and -amylase activity. Fed-batch cultivation resulted in increases in the specific growth rate, maximum cell concentration and -amylase activity. Although the latter two parameters were higher when the broth was supplemented with both starch and concentrated medium, the specific growth rate was relatively smaller. Cultivation in a dialysis reactor gave a cell concentration of 2 109 cells/ml, which represents a 2.8-fold increase over that obtained in ordinary batch cultivation. This increase in the cell concentration was accompanied by a 5.2-fold increase in -amylase activity.