Abstract:
Increasing interest in biological surfactants has led to intensified research directed at more cost-efficient production of biosurfactants, relative to traditional surface-active components based on petrochemical feedstocks. This publication will focus on a new integrated process for continuous rhamnolipid (RL) production. RL was synthesized by Pseudomonas aeruginosa DSM 2874 and was continuously removed in situ by foam fractionation. To prevent loss of the biocatalyst through foaming, bacteria were entrapped in magnetic alginate beads. Immobilizates were retained from the foam by high-gradient magnetic separation and back-flushed in the bioreactor at constant intervals. It was demonstrated that continuous RL production in a 10-L bioreactor over several cycles with intermediate growth periods is feasible. Complete separation of RLs from the production medium with an average enrichment ratio of 15 in the collapsed foam was demonstrated, yielding a final RL amount of 70 g after four production cycles.