

A NEW FILTER APPARATUS FOR SELECTIVE BIO SEPARATION

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Abstract:

One of the emerging fields in downstream processing of the modern biotechnology lies in the use of particulate systems with functionalized surfaces to separate a target bio product like protein, enzyme, DNA etc. from bio broth by selective adsorption. Especially here the application of magnetic separation methods by using functionalized magnetite seeded polymer particles has emerged strongly for analytical purposes. To apply the same process concept to industrial bio production processes new technologies have to be provided which allow effective, reliable and economical service.

The combination of two classical separation mechanisms, cake filtration and magnetic separation, described in this paper, results in positive synergetic effects and an extension of the field of application of the cake filtration process into selective bio separation.

Experimental results with a new magnetic nutsche filter show that the cake filtration process of magnetic particulate products can be improved significantly by superposing a magnetic field, so that the number of operation units in downstream processing can be reduced. In principle this process can be utilized for any kind of target product. One challenge is to find the target specific ligand for the surface functionalization of the magnetic carrier particles. The adoption of principles of the adsorption chromatography may be helpful here.

This paper presents the advantages and potentials of magnetic filtration processes in selective bio separation and shows results of the realization of the magnetic nutsche filter in lab-scale.