

MOVING ADSORPTION BELT SYSTEM FOR CONTINUOUS BIOPRODUCT RECOVERY

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This presentation will propose a continuous purification system in the form of an endless conveyer belt. Basically, it consists of a 4-chamber tank, each responsible for association, unbound washing, elution, and reequilibrium. Specific buffer and liquid speed are able to be employed inside of each chamber. Because of the flexible and bendable structure of the belt, it can pass through each chamber in sequence via rollers located at the bottom of each chamber and at the top of each chamber divider readily for continuous bioproduct recovery. Process development was conducted and the productivity researched to 0.53 mg/cm²/h.

The adsorbent implemented was sulphopropyl functionalized composite fibrous adsorbents constructed in our group with static binding capacity as high as 148 mg/g and dynamic binding capacity (DBC) as 54 mg/g. The values of DBC were independent of flow rate up to 480 cm/h, indicating convective flow. Additionally, the Peclet number of the adsorbent remained constant (> 63.6), further confirming plug flow characteristics with minimal axial mixing.