Aluminum-coated glass wool for the high throughput filtration of biomass without carbon contamination

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Aluminum-coated glass wool effectively filters cellular biomass from oligotrophic waters. These columns are easy to use and provide highly efficient, high-throughput water filtration. Aluminum-coated glass wool filters capture particulates as small as 0.1μm through electrostatic interactions. Particulate acquisition continues, without impeding fluid flow, until all binding sites are filled. As the filter contains no carbon coatings or residues, it is particularly suitable for compound specific radiocarbon analysis (CSRA) which is highly sensitive to carbon contaminants. Investigation of these biological samples isolated through filtration can help to discern composition, age, origin, and perhaps function of microscopic waterborne organisms.

Aluminum-coated glass wool filters have a large retention capacity that enables highly efficient high-throughput water filtration without risk of carbon contamination

Traditional filtration methods clog as large particles are prevented from passing through, causing pressure to increase and flow rate to decrease. Aluminum-coated glass wool filters capture particles through electrostatic interactions, which prevents clogging and allow for high biomass retention. In addition, these column-based filters do not contain carbon coatings which may contaminate samples used in CSRA.

Aluminum-coated glass wool filters have been demonstrated through elution testing to be the most efficient, as compared to other commonly used filter materials, and have the highest retention capacity.

Applications:

• Filters biomass from oligotrophic water in sufficient quantity to perform CSRA.
• Purifies water from particles and bacteria (such as E. coli).
• Scalable design can be adapted to industrial and/or consumer filters.
• Filters DNA, proteins, cells or other compounds as small as 0.1μm in size.
• Purifies high concentrations of single compounds.

Advantages:

• Increased efficiency of filtration for waterborne biomass.
• Specially designed for filtration of low nutrient, low biomass waters.
• Retention rate exceeds requirements for CSRA application without carbon contaminants.
• Easy to deploy and simple to use.
• Captures particles as small as 0.1µm.
• Filtration is carried out through electrostatic interactions to avoid clogs and decreased throughput.

Patent information:
Patent Pending

Licensing Status: Available for licensing and sponsored research support

Related Publications:

Inventors

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