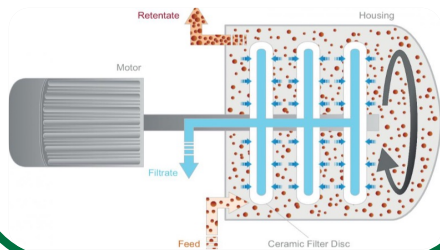


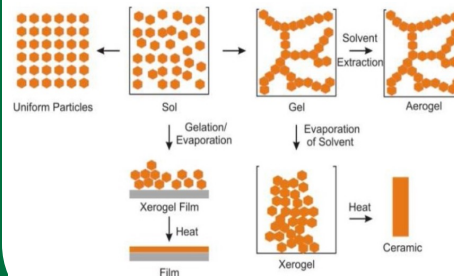
Introduction

In the realm of industrial filtration, "DCF" have emerged as a powerful technology for separation. It employs ceramic membrane discs as essential components, composed of Al_2O_3 . However, the longevity and durability of these discs in the face of aggressive cleaning procedures. The Lifespan claim is 300 hours of caustic cleaning. Nonetheless, real-world industrial environments often necessitate rigorous and frequent cleaning cycles with caustic solutions, leading to frequent replacement and incurring substantial costs.



Methods

synthesis of sol-gel coatings from ZrO_2 , TiO_2 , and a combination of both. These sol-gels will apply onto ceramic membrane discs to achieve uniform coating coverage. The coated and uncoated discs will then be subject to 300 hours of caustic cleaning, then will be compared for permeability, particle structure, pore size before and after cleaning, and pressure resistance.



Outcome

Filtration comparison



Visuals of new discs



Visuals of cleaned discs



Titanium oxide sol-gel



There is yet work and results to come

Perspective

- Sol-gel coatings offer potential for significantly prolonging ceramic membrane disc lifespan.
- Enhanced disc durability leads to cost savings.
- Environmentally friendly industrial filtration, reducing waste generation.
- Investigating sol-gel coatings expands material options for improved disc durability.
- Findings impact water treatment, pharmaceuticals, food production, enhancing filtration efficiency.