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香港城市大學
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Multifunctional Fabrics With Antibacterial, Filtration, and Self-cleaning Properties

Energy & Environment
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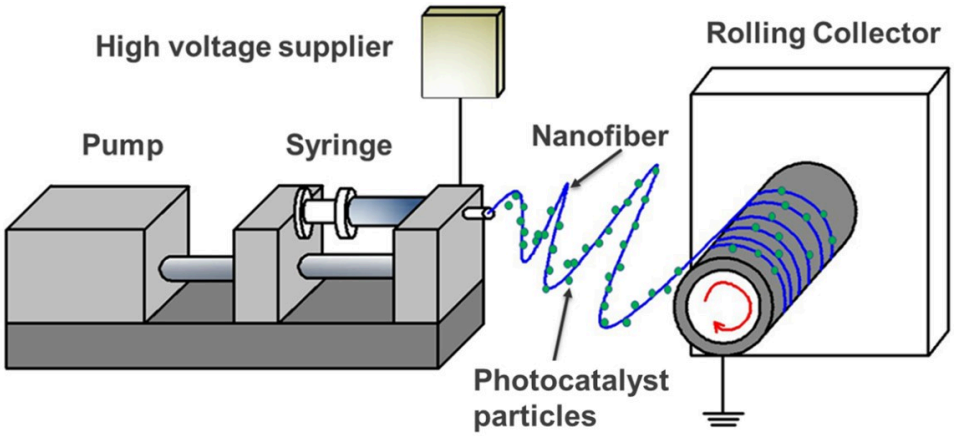
Manufacturing

Nanotechnology and New Materials



IP Status
Patent granted

Technology Readiness Level (TRL) ? 4

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Opportunity

Scaling up for industrialization still faces challenges, primarily in reducing production costs (raw materials and energy consumption) and optimizing manufacturing processes.

Technology

The key technologies include the following aspects:

1. Photocatalyst preparation technology, primarily based on our self-developed methods, including hydrothermal synthesis and thermal treatment processes.
2. Electrospinning technology, which evenly attaches our developed photocatalysts onto carbon fibers to form photocatalytically active fiber membranes. The membrane's properties, such as air permeability, toughness, wettability, and filtration efficiency, can be optimized by adjusting the solvent or electrospinning parameters.be adjusted by changing the solvent or electrospinning parameters.

We developed multifunctional photocatalytic fabrics incorporating carbon-doped zeolite or thermally treated ZIF-8 via electrospinning. These fabrics effectively capture PM2.5 particles and kill bacteria under light exposure, making them ideal for disinfection, air purification, and use in masks, protective gear, and related products.

Advantages

- Broad-spectrum responsive photocatalytic activity
- Antibacterial and self-cleaning capabilities
- Non-cytotoxic
- Effective capture of bacteria and particles

Applications

- Mask, protective apparel
- Curtains, wall coverings
- Air purification filter
- Water purification filter