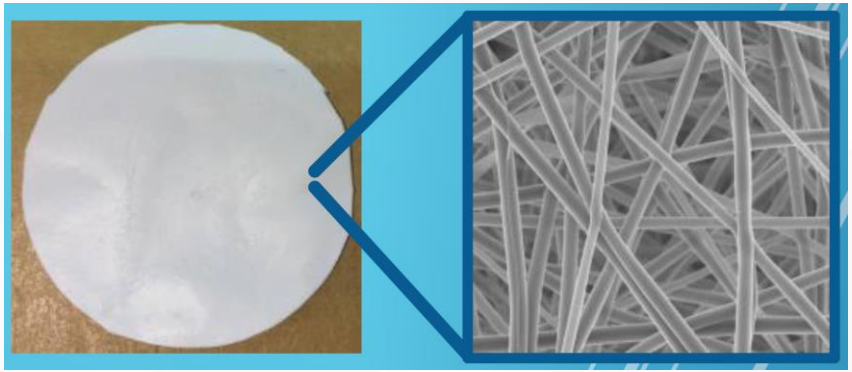
Nano Fiber Filter

Sunlight Eco-tech Limited

Nano Fiber Filter



納米纖維膜是一種用納米尺度的纖維編織成的膜。具有穩定的孔徑，高孔隙率，高比表面積等優點。可用於污染物的快速過濾。

Nanofibrous membranes are fabricated by nanoscale fibers, which endows them with stable pore size, high porosity and high surface area for rapid contaminants removal.

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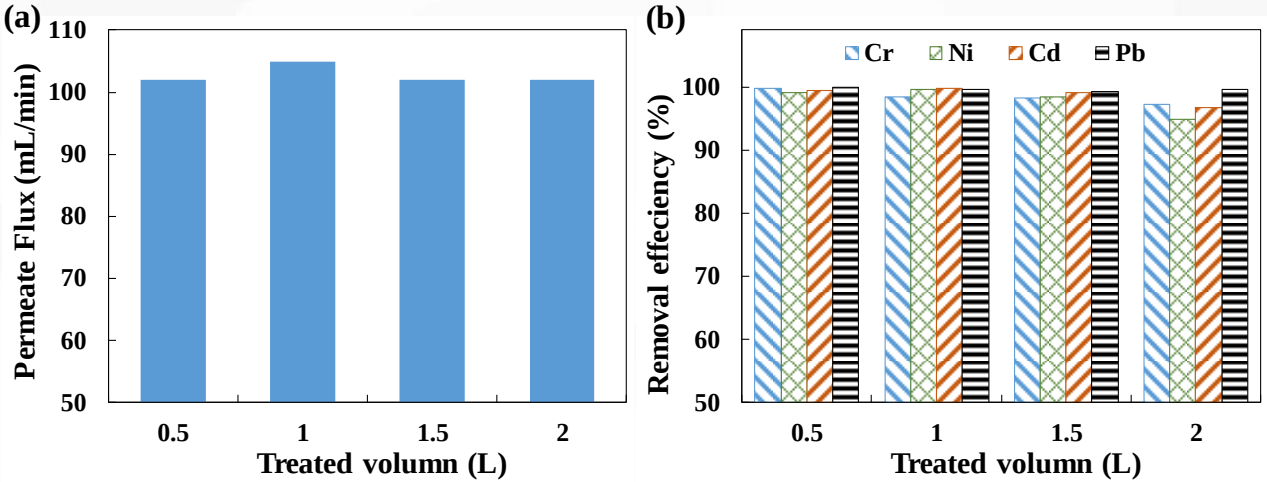

	Pb^{2+}	Cd^{2+}	Ni^{2+}	Cr^{3+}
Feed solution, (μg/L)	50	50	50	50
	Residual heavy metal concentration after filtration			
Our filter	< 0.05	< 0.05	< 0.05	< 0.05
Commercial product #1	32.4	3.2	10.1	17.6
Commercial product #2	9.9	1.6	5.0	5.7
WHO standard, (μg/L)	10	3	70	50

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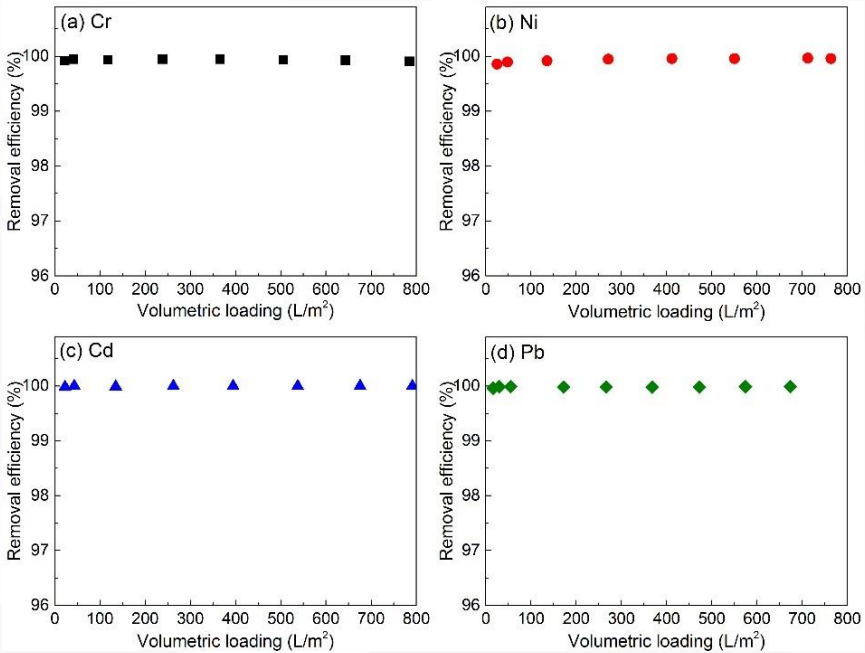
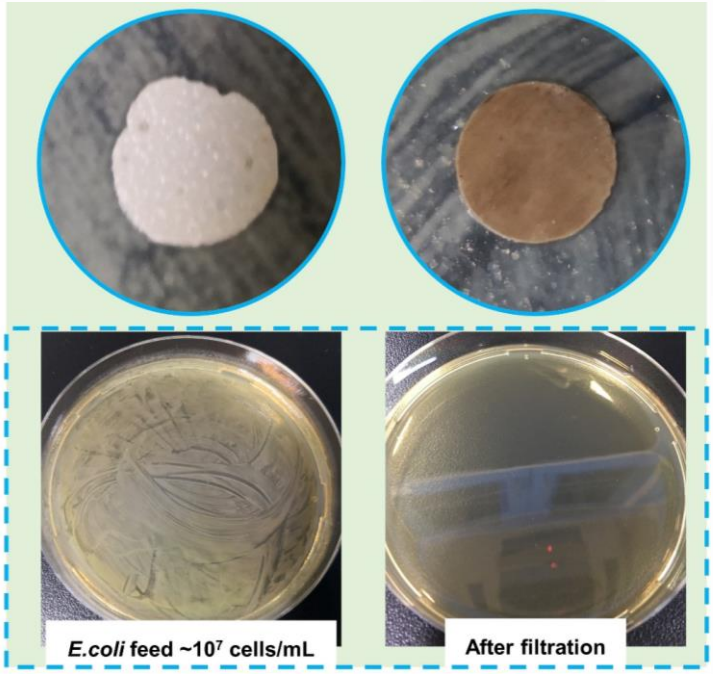


The remove rate for (a) Cr, (b) Ni, (c) Cd beyond 99%

對於(a) Cr, (b) Ni, (c) Cd 及 (d) Pb的去除率達到99%以上



The filter rate for E.coli beyond 99.99%

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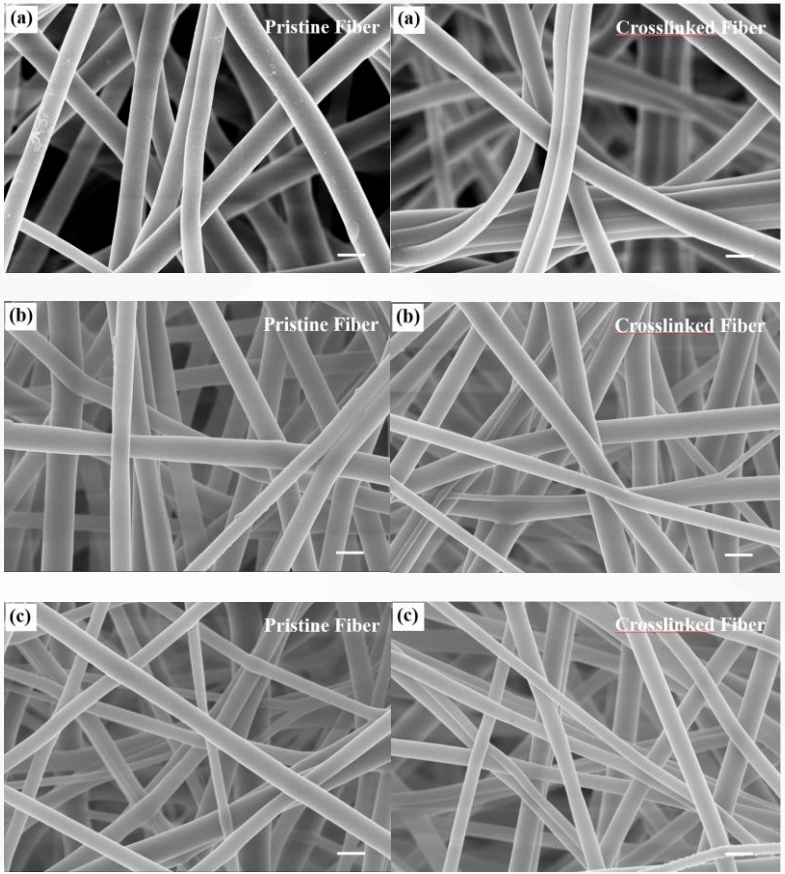

Porosity (%)	BET surface area (m^2/g)	Mean pore size of nano fiber filter (nm)
90.6	7.4	1250
89.3	8.6	790
88.6	8.1	860

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License and Patents

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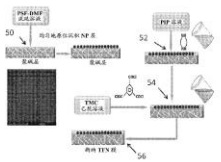
(54)发明名称

具有高生产量和水消毒性能的手提式重力驱动的水过滤器的制备

(57)摘要

形成了具有高生产量和水消毒性能的手提式重力驱动的水过滤器。用于该水过滤器的膜可使用静电纺丝法和非溶剂诱导的相转化法制造。设计了一种新型复合膜结构(交织复合结构)用于进一步增强透水性和机械强度。复合膜可由来自相同聚合物或不同聚合物的具有不同直径的纳米纤维组成。可控制膜孔隙率和表面孔径。可在膜的表面上原位加载银纳米颗粒。开发的过滤器有效去除宽范围的污染物(例如病原体、悬浮的固体和重金属)。净化过程可在重力驱动下进行(具有用于机械增强过滤选项)而无需电力。



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(54) Title: PREPARATION OF HAND-CARRY GRAVITY-DRIVEN WATER FILTER WITH HIGH THROUGHPUT AND WATER DISINFECTION PERFORMANCE

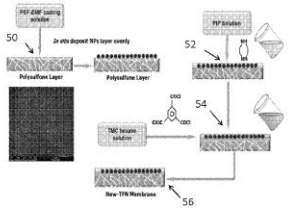

Fig. 6b

(57) Abstract: A hand-carry gravity-driven water filter with high throughput and water disinfection performance is formed. Membranes used for this water filter can be fabricated using electrospun method and non-solvent induced phase inversion method. A novel composite membrane structure (interwoven composite structure) was designed for further enhances water permeability and mechanical strength. The composite membrane can be composed of nanofibers with different diameter from the same polymer or different polymers. Membrane porosity and surface pore size can be controlled. Silver nanoparticles can be in-situ loaded on the surface of the membranes. The developed filter is effective for removal of a wide range of contaminants (e.g., pathogens, suspended solids and heavy metals). The purification process can be carried out under the drive of gravity (with an option for mechanically-enhanced filtration) without electricity.

[Continued on nextpage]

WO 2018/027479 A1

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