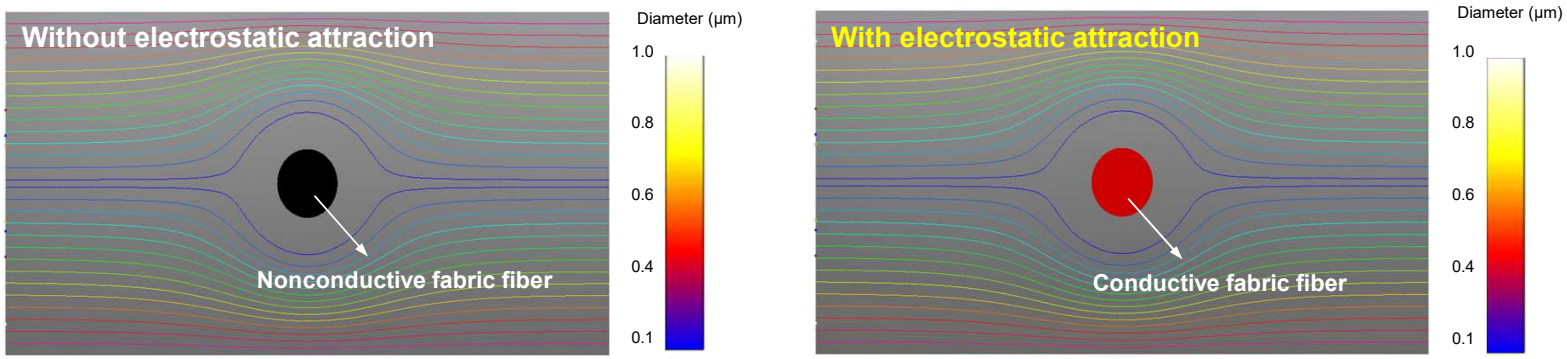
3) Aluminum coated conductive filter for removal of fine particulate air pollutant

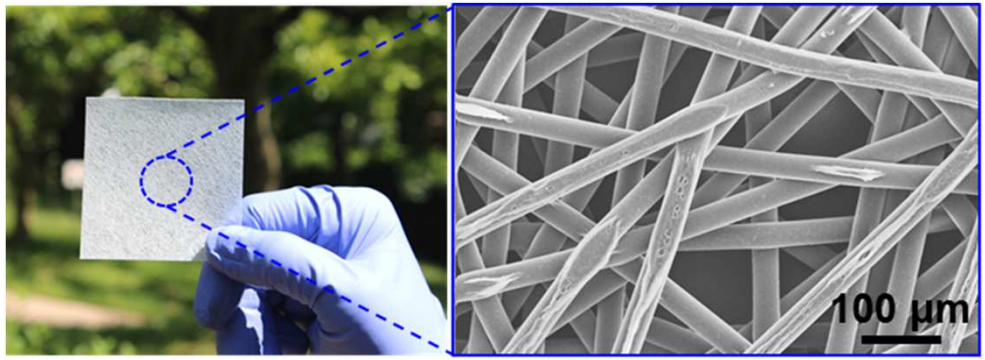


In removal of fine particulate pollutants, Alink suggested a new conceptual approach, combining filtration and electrostatic deposition mechanisms for management of such pollutants instead of utilising HEPA (high efficiency particulate air) filters with high pressure drop. As such, Alink has been successful in turning this vision of conceptual technology into reality, developing an aluminium coated conductive filter module and fabricating a prototype air cleaner with the aforementioned technology implemented; it possesses characteristics such as high removal efficiency of fine particulate pollutants and low pressure drop.

알링크는 미세먼지 제거를 위해 일반적으로 사용되는 높은 압력손실을 유도하는 HEPA 필터를 사용하는 대신 여과집진과 전기집진 메커니즘이 결합된 새로운 개념의 기술을 제안했습니다. 또한 이렇게 제안된 개념기술을 구현하기 위해 압력손실은 낮으면서 높은 미세먼지 제거성능을 지닌 알루미늄이 코팅된 전도성 필터모듈을 개발했으며 개발된 전도성 필터모듈로 구성된 공기청정기 시작품 제작도 완료하였습니다.

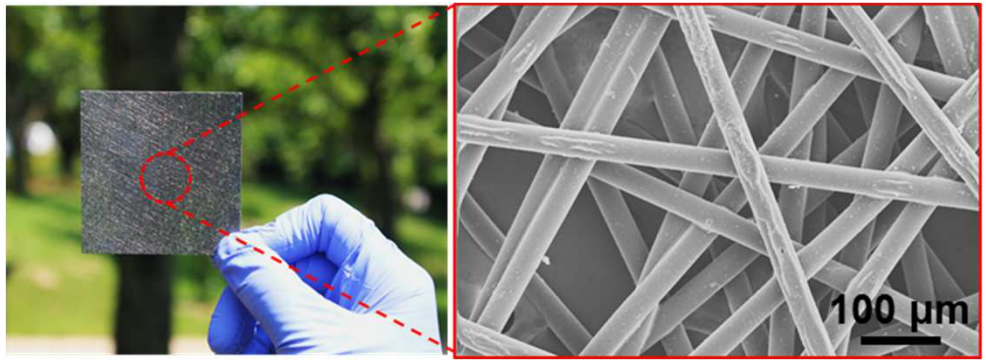
● Aluminum coated conductive filter and its microstrucures

a)



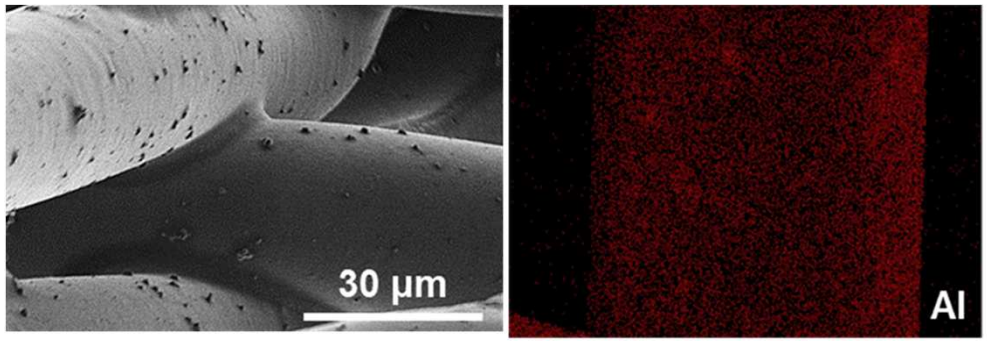
Polyester unwoven filter without aluminum nanostructured film

b)



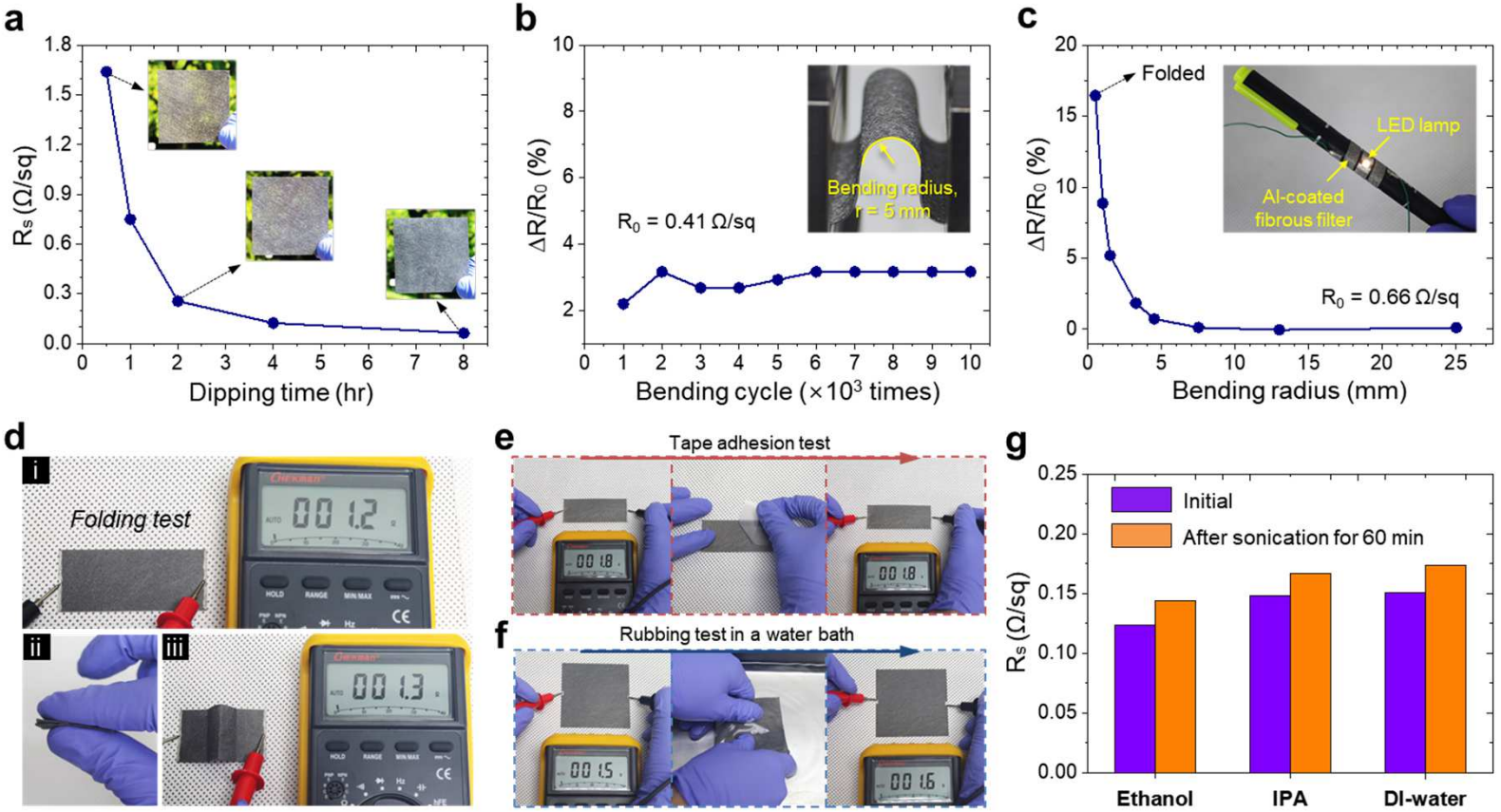
Aluminum coated conductive polyester unwoven filter prepared by Alink's technologies

c)



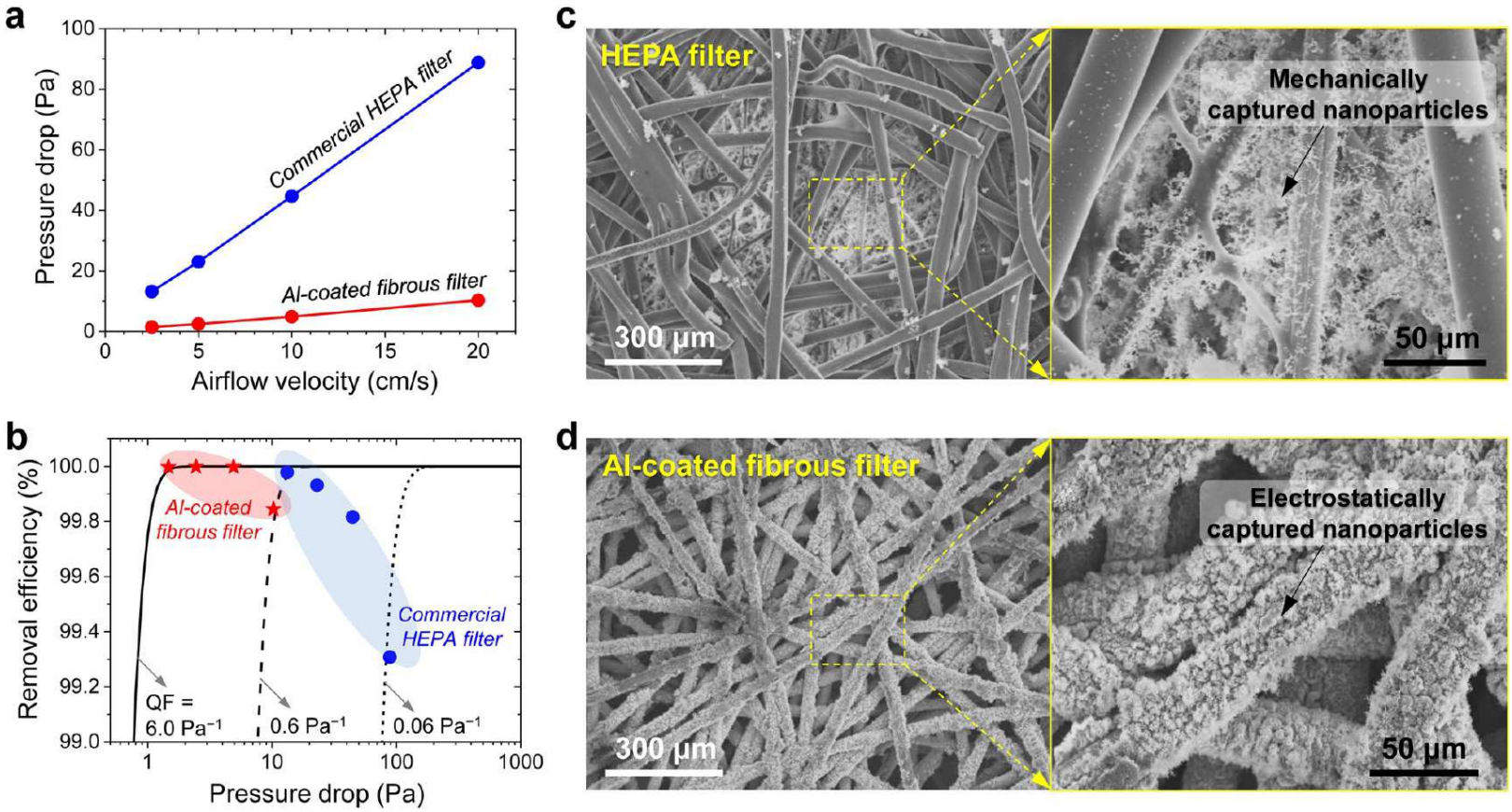
Microstructures and X-ray analysis of aluminum coated conductive polyester unwoven filter prepared by Alink's technologies

● Electrical, mechanical & chemical properties of Al coated conductive filter



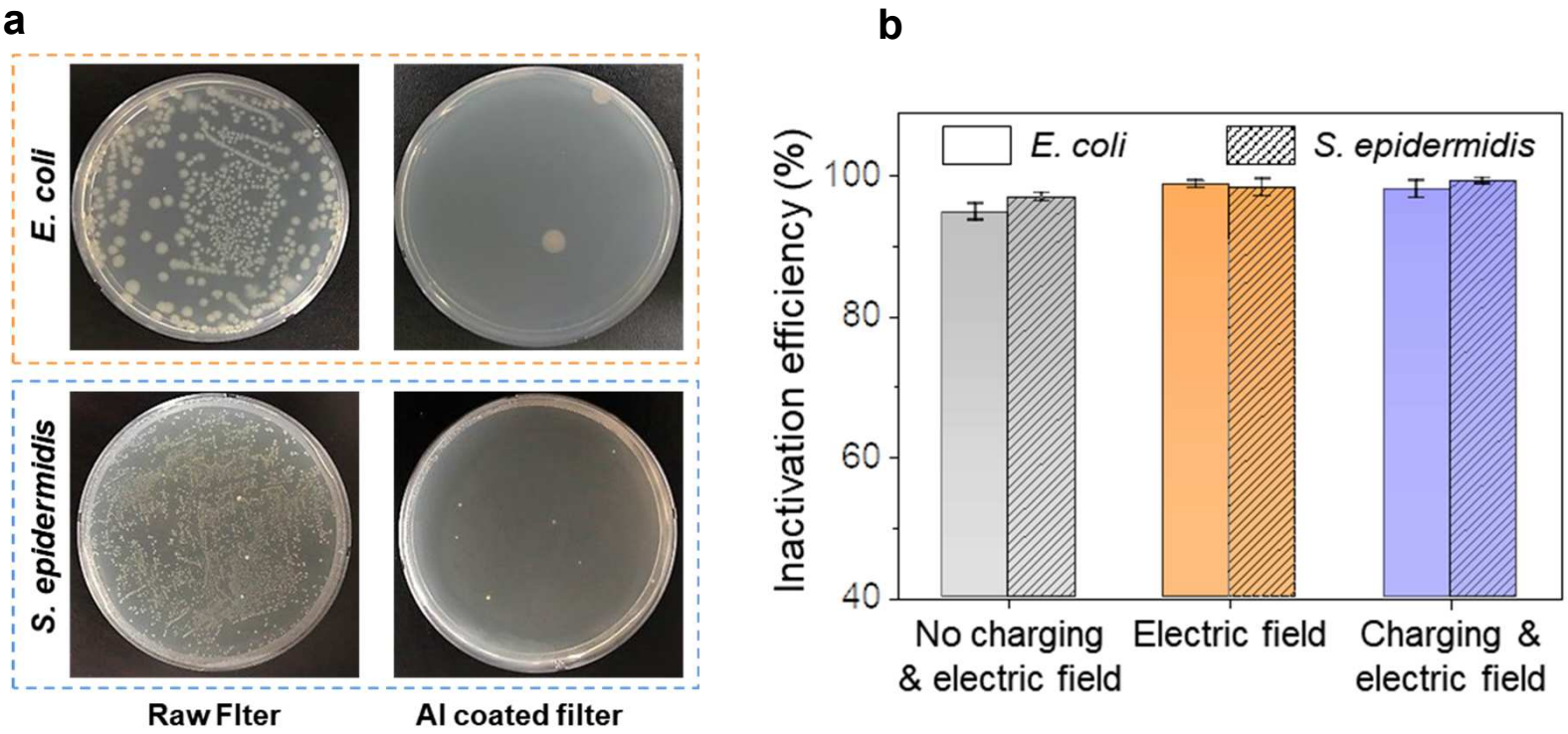
a) Electrical resistances of Al coated unwoven filter with process time, b), c), d), e) mechanical endurance (bending test, folding test, tape test), f), g) chemical endurance (rubbing and sonication test in water and alcohol solvents)

● Removal efficiency of fine particles and pressure drop of Al coated conductive filter



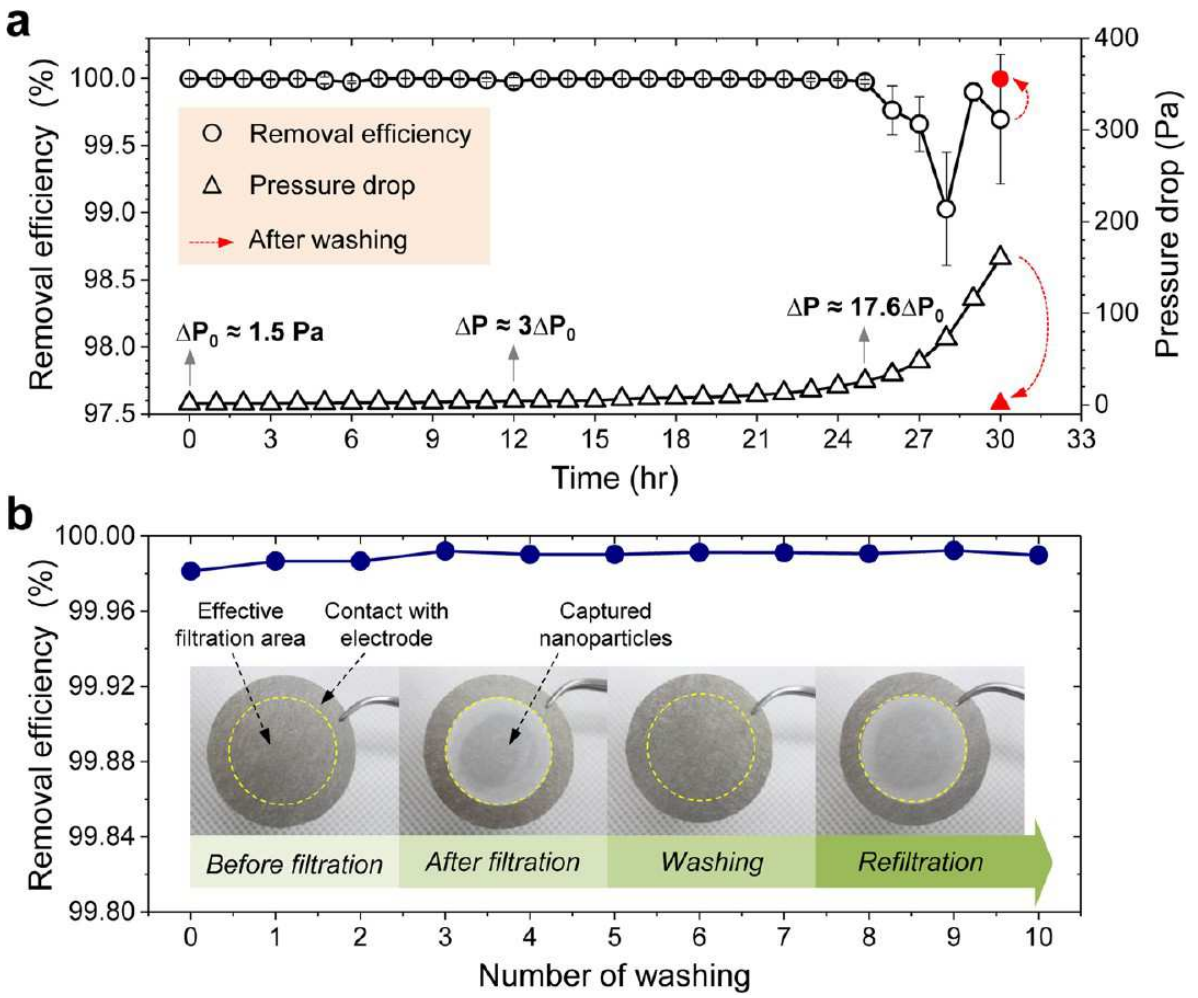
a), b) comparison of Al coated conductive filter with HEPA filer in pressure drop and fine particle removal efficiencies, c) fine particles collected on HEPA filer, d) fine particles collected on Al coated conductive filter; Al coated conductive filter is much higher than a commercial HEPA filter in a filer quality factor (QF = -ln(1-*h*)/D*P; h:* removal efficiency*,* D*P:* pressure drop)

● Antimicrobial property of aluminum coated conductive filter



a) Cultures of E. coli and S. epidermidis sampled from each of the raw filter and Al coated conductive filter, b) antimicrobial activities of Al coated filter with electrical operating condition; These results show that the Al coated conductive filter has strong antimicrobial activity; Aluminum coated conductive filter shows more than about 95% in inactivation efficiency for bioaerosol of *E. Coli & S. epidermidis*

● Recyclability of Al coated conductive filter



Long-term performance and recyclability. (a) Changes in the removal efficiency and pressure drop (ΔP) according to the filtration time of the conductive filter. (b) Monitoring of the particle removal performance over 10 washing cycles. Inset photos show the conductive filter before filtration, after filtration, after being cleaned with DI water in an ultrasonic bath for 10 min, and after refiltration, respectively.