Moisture Energy Harvesting for Distributed Electronics

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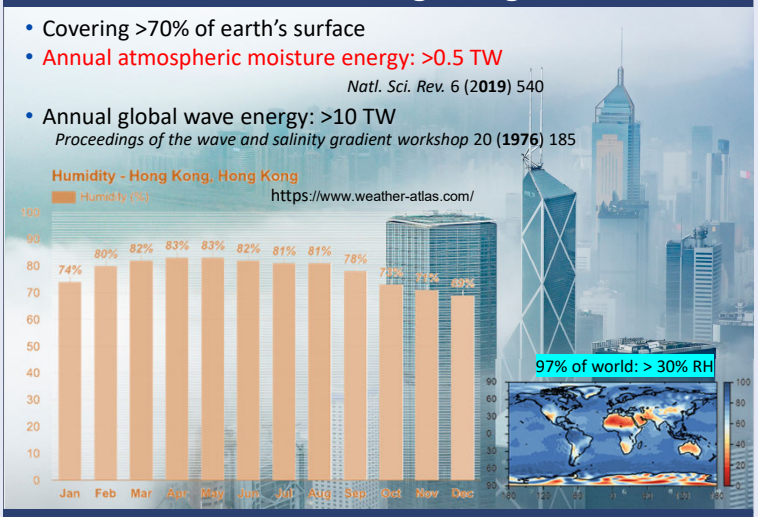
Humid Hong Kong

- Covering >70% of earth's surface
- Annual atmospheric moisture energy: >0.5 TW

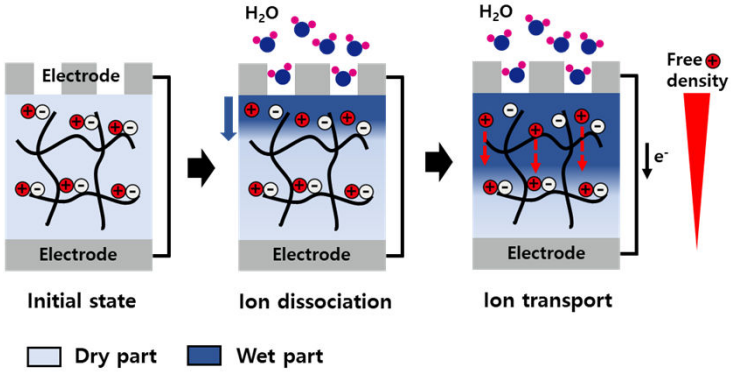
  Natl. Sci. Rev. 6 (**2019**) 540
- Annual global wave energy: >10 TW

  Proceedings of the wave and salinity gradient workshop 20 (**1976**) 185



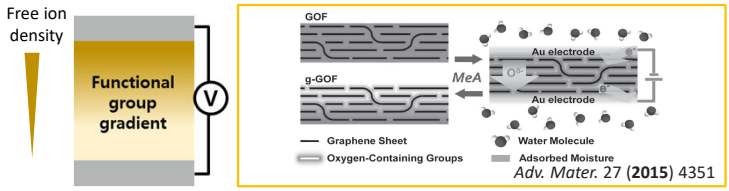
Moisture Electricity Generators (MEGs)

Asymmetric exposure to moisture induces ion diffusion



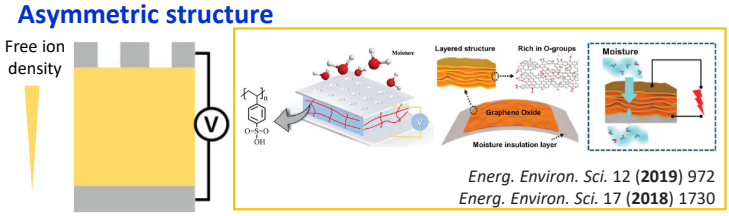
The Shin Group Strategy

Gradient structure



Adv. Mater. 27 (**2015**) 4351

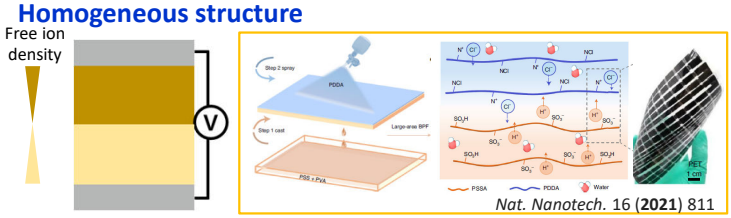
Asymmetric structure



Energ. Environ. Sci. 12 (**2019**) 972

Energ. Environ. Sci. 17 (**2018**) 1730

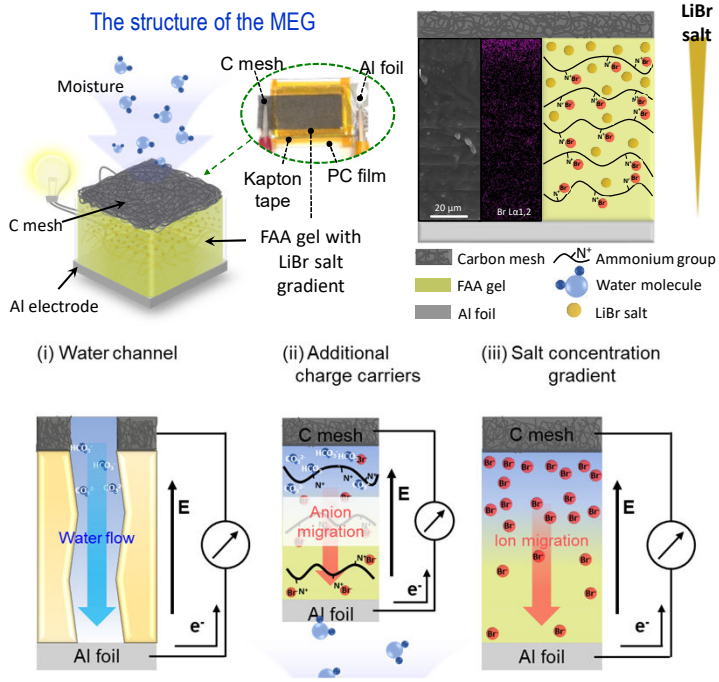
Homogeneous structure

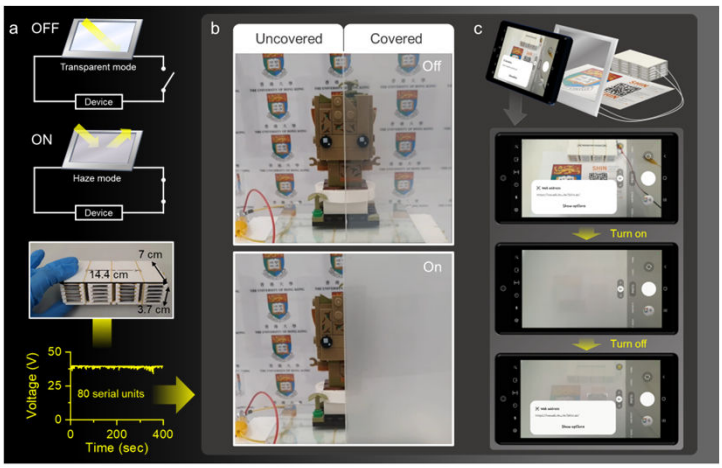


Nat. Nanotech. 16 (**2021**) 811

The Shin Group Research Highlight

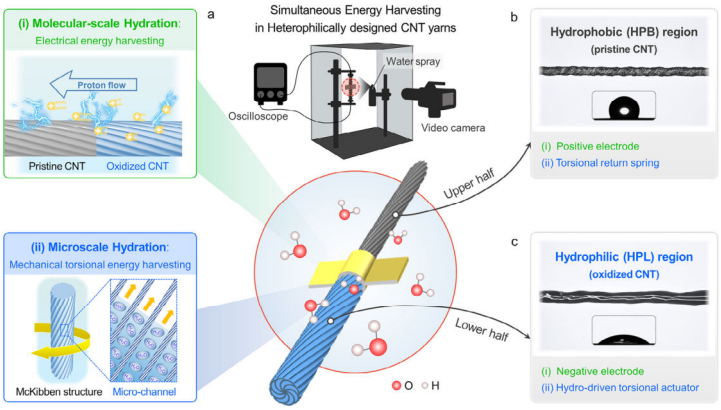
Salt-gradient hydrogel for MEGs!





Adv. Funct. Mater. 35 (**2025**) 2419710

MEG and electromechanical energy harvesting hybridization!



Adv. Mater. 37 (**2025**) 2501111