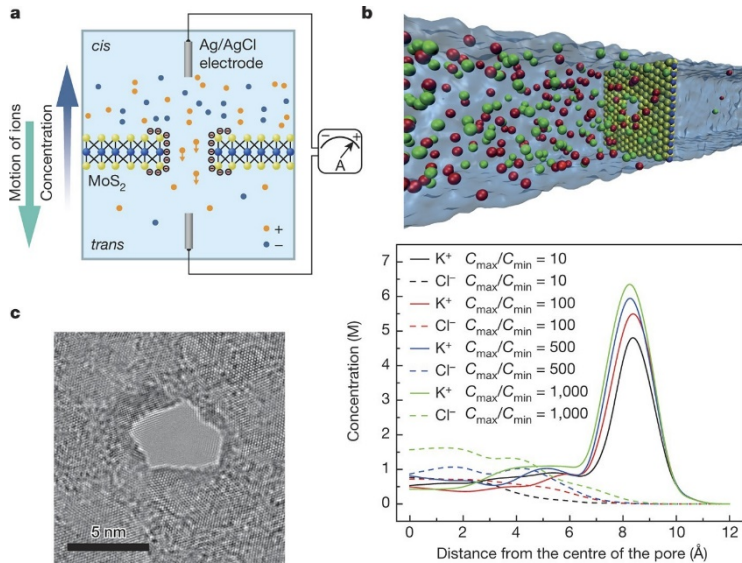


# Osmotic power generator



**a**, Salt solutions with different concentrations separated by a nm-thick MoS<sub>2</sub> nanopore membrane. An ion flux driven by chemical potential through the pore is screened by the negatively charged pore, forming a diffusion current composed of mostly positively charged ions. **b**, Top panel, a typical simulation box used in molecular-dynamics simulations, showing the nanopore membrane (in blue and yellow) and the salt (green and red) in solution. Bottom panel, molecular-dynamics-simulated potassium-ion and chloride-ion concentrations as a function of the radial distance from the centre of the pore. The region near the charged wall of the pore is representative of the electrical double layer. C<sub>max</sub>, maximum concentration; C<sub>min</sub>, minimum concentration. **c**, Example of a TEM-drilled MoS<sub>2</sub> nanopore of diameter 5 nm.

Ref. Nr

6.1590

Keywords

Power generator, blue energy

Intellectual Property

EP and US granted  
 WO 2014/141168 A1

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<https://actu.epfl.ch/news/electricity-generated-with-water-salt-and-a-3-atom/>

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## Description

The technology is a power generator using nanopore technology to convert an osmotic salt gradient into electricity.

It is a unique solution that does not rely on pressure-retarded-osmosis (PRO) but harnesses differences in osmotic potentials.

## Advantages and applications

Power generation using renewable sources (e.g. see water).

Scalable to generate high power density of several to tens of kWm<sup>-2</sup>.

Easily applicable to ultralow-power devices.

## Offering

Licensing or collaboration