

Pond Weed to Make Membranes to Separate Oxygen

Membrane that separates pure oxygen from a mixture of gases has been synthesized from a pondweed water hyacinth by scientists at the State Forensic Science Laboratory and Fuel Cell & Battery Division, CSIR-Central Glass & Ceramic Research Institute, Kolkata in their recent study.

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Perovskite membranes are used in the energy sector for efficient burning of fuels because they supply pure oxygen by separating it from a mixture of gases. Oxygen-separating membranes can be used to mitigate climate change by efficient utilization of primary energy sources in energy industry by providing pure oxygenated air. It could also be used to manufacture futuristic “carbon dioxide-free power plants” that would be a tool in our endeavor to protect the environment.

Scientists at the State Forensic Science Laboratory and Fuel Cell & Battery Division, CSIR-Central Glass & Ceramic Research Institute, Kolkata have synthesized perovskite membranes that separate pure oxygen from a pondweed called water hyacinth.

It is known that water hyacinth floats on water by using a natural perovskite type oxygen separation membrane in its petiole, a structure that joins the leaf to the stem. The scientists used water hyacinth for making oxygen-separating membranes and claim that it is a wonderful choice by saying, “The idea of using such water pollutant to produce engineered microstructure for improving material’s functionality is the philosophy behind the present study”.

The scientists collected water hyacinth from local ponds, washed it several times, and removed petioles followed by oven drying for 24 hours. The dried petiole powder was treated with chemicals, and heated in a furnace to yield a material that could be used to make oxygen-separating membranes.

They found that oxygen-separating membrane manufactured by using this new process that uses water hyacinth is two times better than a conventionally prepared membrane. Since, the new membrane shows more physical and chemical stability, the process could also improve the manufacturing of membranes that are used for other applications.

Reference: *J Membrane Science* **522**: 168-174.