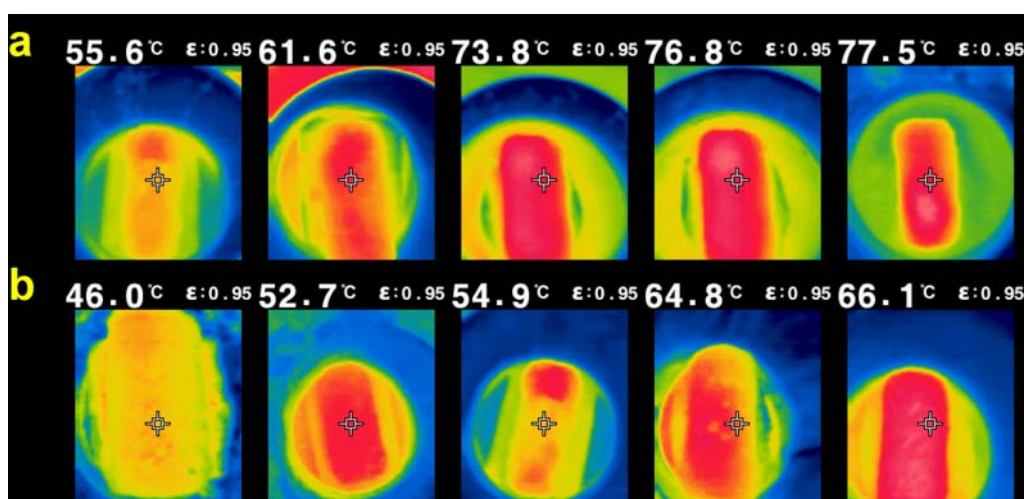


# Synthesis and evaluation of nitrogen doped 3D-reduced graphene oxide nanosheets (3D N@rGO) potential application for solar driven interfacial desalination

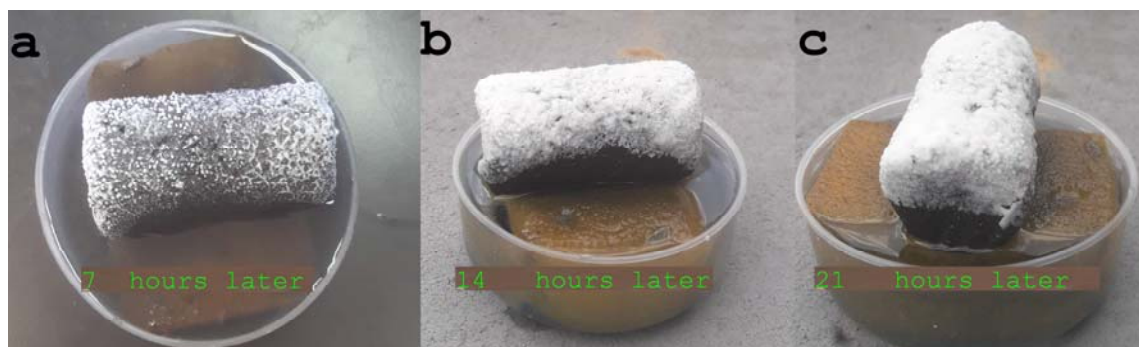
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**Supplementary Figure 1.** Comparative evaluation of the solar absorption capabilities of reduced graphene oxide (rGO) and nitrogen-doped reduced graphene oxide (N@rGO), observed under direct solar radiation. The temperature response of both materials was monitored using an IR camera to assess their solar absorption efficiency.



**Supplementary Figure 2.** Progressive salt accumulation on the 3D N@rGO solar absorber with 20% salinity level; after 7 hours (a), 14 hours (b), and 21 hours of solar driven interfacial desalination tests (c) under 1 sun solar irradiation.

The synthesis of 3D nitrogen-doped reduced graphene oxide (N@rGO) with a top surface area of 0.0028 m<sup>2</sup> requires 4.5 grams of graphene oxide (GO) and 5 grams of ethylenediaminetetraacetic acid (EDTA). Consequently, producing 1 m<sup>2</sup> of N@rGO requires 1605 grams of GO and 1786 grams of EDTA. According to Tour's method, 5 grams of GO are obtained from 3 grams of graphite nanoflakes. To scale up the production from 5 grams to 1605 grams of GO, a scaling factor of 321 is applied, meaning all ingredient quantities must be multiplied by 321. The detailed cost breakdown is as follows:

**Supplementary Table 1** Summary of Chemicals and Costs for the production of 3D N@rGO with total top surface area of 1 m<sup>2</sup>

<b>Chemical</b>	<b>Amount</b>	<b>Price (USD)</b>	<b>Supplier</b>
Graphite	983.0 g	\$65	Sigma Aldrich
Potassium permanganate	5778.0 g	\$346	Sigma Aldrich
Sulfuric acid	109.2 L	\$144	Mining Chemicals SA
Phosphoric acid	12.84 L	\$960	Sigma Aldrich
Hydrogen peroxide	12.84 L	\$267	Sigma Aldrich
EDTA	1786.0 g	\$455	Sigma Aldrich
<b>Total Cost</b>		<b>\$2237</b>	