

SOLAR DRIVEN PHOTOCATALYST FOR WATER PURIFICATION

IITM Technology Available for Licensing

Problem Statement

- Global access to safe and clean drinking water is still a distant goal, with water sources contaminated by a variety of emerging contaminants (ECs).
- Conventional water treatment methods are ineffective against the low concentrations of these contaminants, leaving many water sources unfit for consumption.
- Utilizing solar-driven photocatalysts to remove contaminants in real-time conditions is a significant challenge**, particularly in regions with abundant sunlight like India.
- Developing effective and practical solutions for solar-driven water purification is essential.

Intellectual Property

- IITM IDF Ref. 2413
- IN 202241058404

Technology Category/ Market

Category - Water Purification

Applications- Water Treatment, Solar-Powered Purification, Photocatalyst in contamination and pollution challenges.

Industry - Environmental Remediation, Water Purification.

Market- The global solar water purifier market size is forecast to reach \$3.5 billion by 2027, growing at a **CAGR of 8.92%** from 2022 to 2027.

TRL (Technology Readiness Level)

TRL - 3: Proof of concept stage.

Research Lab

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2. Photocatalytic Plate

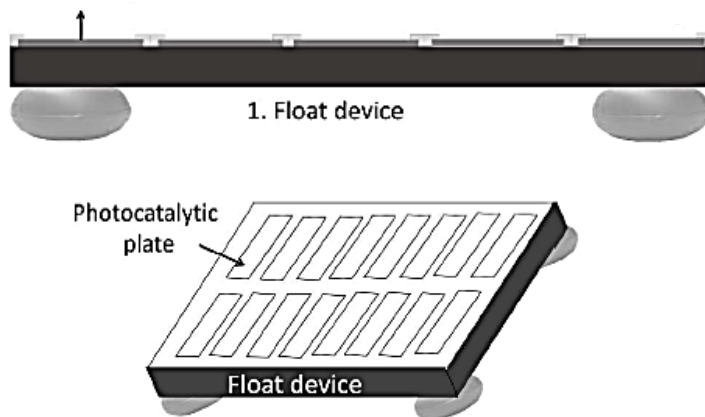


FIG.1. Shows the photocatalytic sheets/plate mounted on the floating device.

Technology

The present invention relates to a **liquid purification floating device** comprising a photocatalyst comprising a nanocomposite of oxides of tantalum and niobium or non-metal doped oxides of tantalum and niobium nanocomposites or both. (Fig. 1&2)

1. Components

- The device consists of a float and a photocatalyst nanocomposite sheet or thin film.

2. Float Function

- The float is designed to remain afloat on a fluid surface.

3. Photocatalyst Nanocomposite

- The device incorporates a photocatalyst nanocomposite sheet or thin film, which contains a photocatalyst.

4. Pollution Decomposition

- The photocatalyst nanocomposite sheet or thin film is engineered to decompose pollutants present in the liquid, contributing to liquid purification.

Functions

- The photocatalyst efficiently degrades pollutants or contaminants present in liquid under visible, UV or solar radiation.

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Key Features / Value Proposition

1. Innovative Photocatalyst:

This photocatalyst uses tantalum and niobium oxides or non-metal-doped oxides for efficient pollutant decomposition.

2. Versatile Form:

It can be in sheet or thin film form, suitable for various applications.

3. Compatible Substrates:

The nanocomposite can coat substrates like glass, metals, polymers, and more.

4. Effective Liquid Purification:

The device floats on liquid surfaces, effectively breaking down pollutants with visible or UV light.

5. Reusable and Replaceable:

The photocatalyst sheet is reusable and replaceable, ensuring cost-effectiveness.

6. Optional Oxidizing Agents:

Oxygen, ozone, or peroxides can be added to enhance purification.

7. Batch or Continuous:

The method is adaptable for both batch and continuous purification processes.

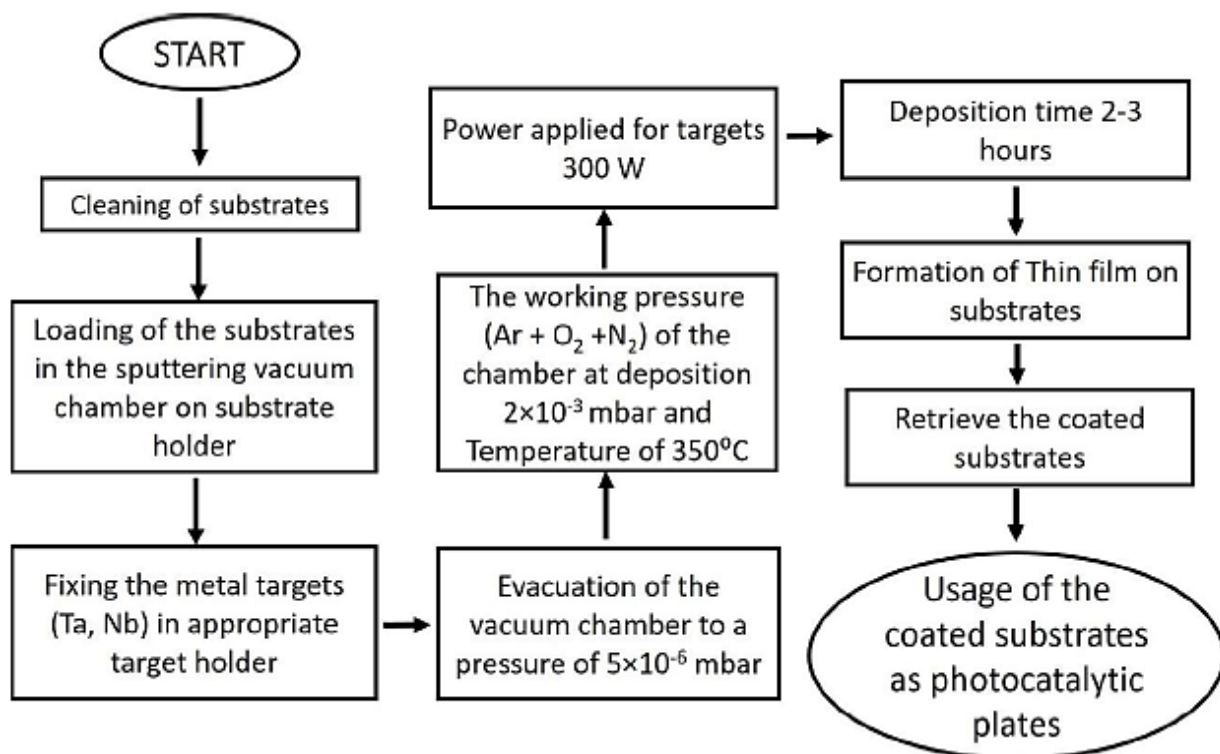


FIG. 2. Shows a flowchart of the thin film deposition procedure.

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