Karnataka State Council for Science and Technology
Student Project Program-42nd Series
Project Proposal Reference: 42S_BE_2435

**Title of the Project:** DESIGNING AND DEMONSTRATION OF CATALYST DECORATED FLOATING SPHERES OF SURFACE WATER TREATMENT USING ALTERNATIVE DRIVING ENERGIES

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Key Words
1. Floating Sphere
2. Hydrothermal Method
3. Nano-Micro Materials
4. Characterization
5. Photocatalytic Degradation
6. COD

Introduction
A number of water sources contain contaminants which are hazardous to health and environment, several treatment technologies have been employed for the treatment of contaminated water. Industrial operation handled large volume of process water, which are with are contaminated heavy metals are frequently encountered in industrial effluents. For to overcome from the above problems we have chosen project for the treatment of surface water using alternative energies.

Objectives
- Preparation of Floating Spheres (Natural Clay, Bentonite Powder, Charcoal, Cellulose)
- Synthesis of Nano-Micro size Titanium Dioxide by hydrothermal method.
- Characterization by powder –XRD (to know the phase), FTIR (to know the presence OH+ radicals), SEM (to know the size and morphology of the obtained material), Photoluminescence Spectra (PL Spectra) to the wave length.
- Water treatment will be carried out using obtained Floating sphere coated with Titanium Dioxide
- Percentage of photo catalyst degradation will be carried out through photo spectrometer.
- Initial and final COD of water will be calculated to know the percentage of photo catalyst degradation

Methodology
- Synthesis of Nano-Micro size Titanium Dioxide and Floating Spheres by hydrothermal method.
- Characterization by powder –XRD, FTIR, SEM and Photo luminescence spectra
- Surface Water treatment was carried out using obtained Floating sphere coated with Titanium Dioxide
- Percentage of photo catalyst degradation were carried out through photo spectrometer.
Initial and final COD of water has been calculated to know the percentage of photocatalyst degradation.

Results and Conclusions
- Synthesis of Floating Sphere (Natural Clay, Bentonite Powder, Charcoal, Cellulose) and Nano-micro size Titanium Dioxide as coating material
- A synthesized floating sphere has been treated with contaminated surface water.
- Photo catalyst degradation was carried out for contaminated surface water exposed to sunlight with synthesized Floating Sphere with duration of 1 to 5 hours (10.00 A.M to 3 P.M.)
- Percentage of degradation with respect micro size – nano size has varied with respect to Nano- micro size material
- Photocatalytic activity has also done with LED and Dark Room, Where the percentage of degradation was more in Sunlight.

Scope for the Future Work
- Further the reduction in size (TiO$_2$ Material) also has a great influence in percentage of degradation.
- Water contaminates like Oil and Grease can also be tested and to reduce the effect through photocatalytic degradation.
- The Industrial waste water can also be treated by using these methods.