

SMART PHOTOCAT REACTOR FOR REMOTE CECs REMOVAL



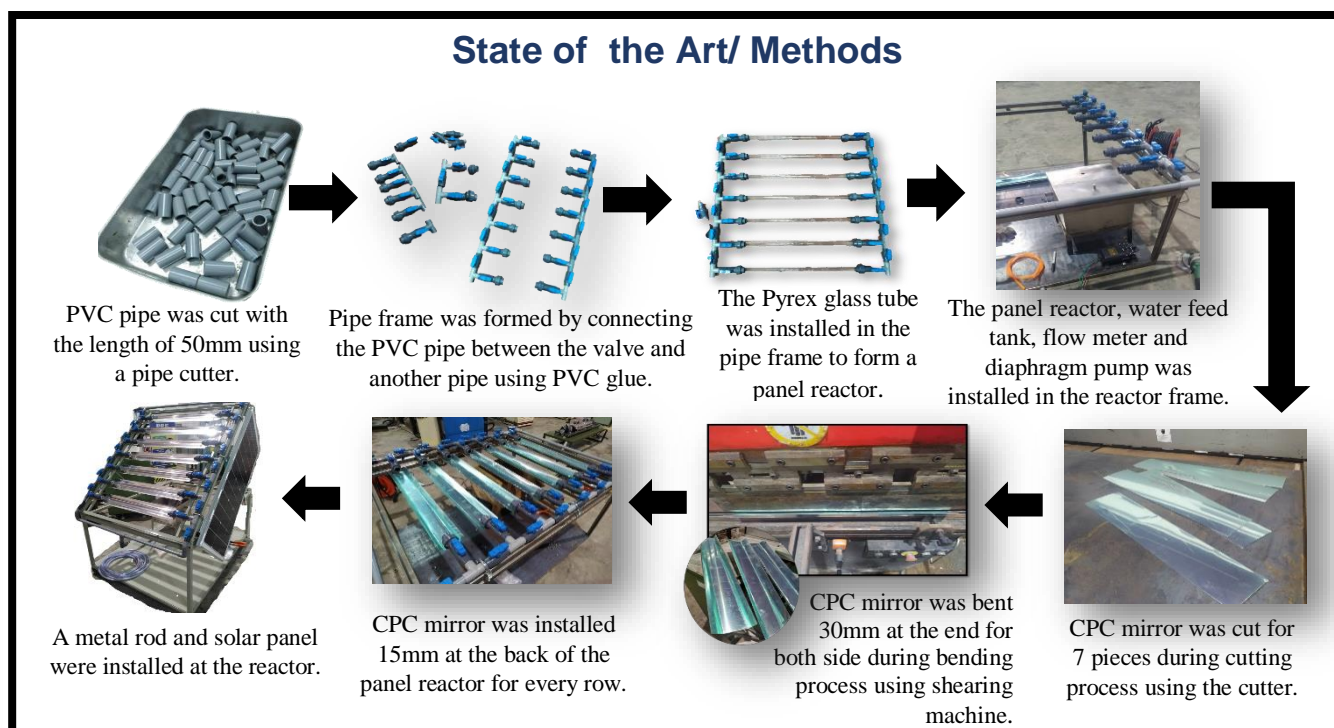
INVENTOR: NUR AINA MARDHIAH BINTI BADRUL HISHAM, DR. ROSMAWATI BINTI NAIM, HAIRUL HISHAM BIN ISMAIL.
FACULTY: FACULTY OF CHEMICAL AND PROCESS ENGINEERING TECHNOLOGY (FTKKP)
UNIVERSITY: UNIVERSITY MALAYSIA PAHANG (UMP)
EMAIL: mardhiahhisham@gmail.com
CO-INVENTORS: NUR AINA MARDHIAH BINTI BADRUL HISHAM, DR. ROSMAWATI BINTI NAIM, HAIRUL HISHAM BIN ISMAIL.

Product Background

- The product powered by photovoltaic solar panel is an efficient system which can be remotely installed in any onsite location for CECs removal.
- Photocatalysts combined with superior adsorptive nanocomposite to degrade the contaminant from any source of wastewater at faster rate.

Environmental Impact

- CECs pose a severe threat to human health and disturb the ecological balance.
- CECs have the potential to induce a large range of acute and long-term effects on human health and ecosystems.



Product Image and Product Characteristics



- Smart and custom-made photocatalytic reactor with adjustable pyrex glass tubing and equipped with photovoltaic solar panel are suitable for any onsite installation at remote area which does not have continuous power supply.
- Combination of adsorptive nanocomposites materials; perovskite lanthanum orthoferrite (LaFeO₃)-modified chitosan would increase the removal efficiency at varies operation condition which depends on the sources of wastewater.
- Cost-effective photocatalytic reactor system which three times cheaper than commercial reactor in the market.

Marketability & Commercialisation

- Potential Clients
 - ✓ Industry or factory used to treat wastewater.
 - ❖ Taliwork Group, Salcon Engineering Berhad, Darco Water Engineering.

Grant

- RDU192301 (Development Of Tubular Photocatalytic Reactor For Industrial Wastewater Treatment) – RM 10,000.00

Industrial Partner

- Ranhill SAJ Sdn. Bhd



Novelty/ Originality

- Utilizing compound parabolic collector (CPC) mirror for effective and maximize collection of sunlight.
- Flexible number of pyrex glass tube for adsorbent liquid flow and modifiable degree of slanting for efficient sunlight receiving.
- Wireless operated photocatalytic reactor which is powered by photocatalytic solar panel .

Usefulness

- Portable photocatalytic reactor which can be installed in any location for CECs removal.
- Combine with superior adsorptive nanocomposite to degrade the contaminant from any source of wastewater at faster rate.
- Adjustable pyrex tube for efficient flow rate of the adsorbent and modifiable degree of slanting to capitalize the collection of sunlight.

Publication

- Development of Photocatalytic Reactor for Solar Light Driven Photocatalyst/ Adsorbents Nanocomposite for Degradation of Contaminants of Emerging Concern (CECs), 2021, Thesis Final Year Project.

Cost Analysis

Custom-made SMART PHOTOCAT REACTOR	Price (RM)	Commercial reactor available in the market
Pyrex Glass Tube	1,200	RM 20,000
CPC Mirror	800	
Water Feed Tank	700	
Diaphragm Pump	350	
Flow Meter	200	
Photovoltaic solar panel	300	
Battery converter	2000	
Others	1000	
Total cost	6,550	