(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :02/10/2025
(21) Application No.202511094830 A
(43) Publication Date : 28/11/2025

(54) Title of the invention : METHOD FOR WASTEWATER TREATMENT USING COPPER-DOPED CARBON QUANTUM DOTS

(51) International classification	:B82Y15/00, B01J35/39, C02F1/30, C02F1/72, C02F1/70, C02F101/30, C09K11/65
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No Filing Date	: :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
ABSTRACT METHOD FOR WASTEWATER TREATMENT USING COPPER-DOPED CARBON QUANTUM DOTS The present invention provides a method for wastewater treatment utilizing copper-doped carbon quantum dots (Cu@CDs) synthesized via a hydrothermal process using citric acid, urea, and copper acetate as precursors. The method includes purification by centrifugation, filtration, and dialysis, followed by lyophilization to obtain nanosized Cu@CDs of about 3–4 nm. When applied to wastewater containing organic dye contaminants, particularly methyl violet 10B, the Cu@CDs function as dual-purpose agents, combining surface adsorption and visible-light-driven photocatalysis. The system achieves up to 98% dye removal within 30 minutes, offering a green, cost-effective, scalable, and reusable approach for industrial effluent remediation. Reference Fig 1

No. of Pages : 13 No. of Claims : 7