

Highlights

- A novel bio material, mollusc shell powder (TMSP) was synthesized for the elimination of Zn(II)
- The synthesized TMSP was characterized by FT- IR, SEM, EDX and BET techniques
- The TMSP was utilized as an efficient sorbent for the removal of Zn(II) through batch and column studies.
- A fiber reinforced polymer fabricated with the TMSP installed at the effluent discharge plants achieved 100% Zn(II) removal from electroplating wastewaters.
- **Graphical abstract**

