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## عنوان مقاله

**3D printing optimisation of a novel structured catalyst for oxidation of cytostatic compounds from hospital wastewater by CWAO**

## چکیده: ۲۵۰ لغت

The continuous catalytic oxidation of cytostatic drugs such as mycophenolic acid (MYC) and methotrexate (MTX) solutions using 3D printed sludge-based catalysts in a trickling bed reactor has been investigated. Catalysts derived from modified sludge, treated with additives such as potassium carbonate, showed improvements in both textural properties and efficiency in the degradation of MYC and MTX. 3D printing technology allows for precisely designing and producing structured monolith catalysts. This study highlights the innovative use of 3D-printed sludge-based catalysts to treat hospital wastewater containing MYC and MTX. The catalyst showed a stable stream activity with an average conversion of 95 % for both compounds ( $T = 100\text{ }^{\circ}\text{C}$ ,  $P = 15\text{ bar}$ ,  $Q_l = 0.3\text{ ml/min}$  and  $Q_g = 150\text{ ml/min}$ .). This work provides new ways to recycle sewage sludge and make highly efficient monolithic catalysts for continuous hospital wastewater treatment with significant implications for environmental protection and public health.