

Thesis Title	Treatment of Organic Matter and Heavy Metals using Sequencing Batch Reactor-Granular Activated Carbon (SBR-GAC)
Thesis Credits	6
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#### Abstract

The research was studied on removal of organic matter (COD) and heavy metals (Copper; Cu and Zinc; Zn) by using sequencing batch reactor - granular activated carbon (SBR-GAC) system. The experiments were carried out by using synthetic wastewater, had COD concentration as 400 mg/L and heavy metal concentration (Cu and Zn) as 10 mg/L. The experiments were separated in 3 parts as adsorption capacity, dosing of granular activated carbon (500, 1,000, 1,500, 2,000 and 2500 mg/L) in SBR system and hydraulic retention time (HRT) of the system.

The results showed that the adsorption capacity of granular activated carbon (GAC) for COD, Cu and Zn were 657.698, 45.836 and 37.763 mg/gGAC respectively. It was found that the efficiencies of SBR-GAC for removal of COD, Cu and Zn during 8 day from starting the system did not show any different from normal SBR system. But after 8 days of operation. The removal efficiencies for COD, Cu and Zn in SBR-GAC were higher than in the normal SBR system. When the hydraulic retention time (HRT) was considered, The COD, Cu and Zn concentrations in the effluents from SBR-GAC system which was operated under HRT of 3, 5 and 10 days, respectively, were 67.800, 44.700 and 24.600 mg/L, 0.236, 0.137 and 0.088 mg/L and 1.204, 0.933 and 0.450 mg/L respectively. On the other hand the COD, Cu and Zn concentrations in the effluents from normal SBR system were 79.400, 74.600 and 23.600 mg/L, 0.438, 0.212 and 0.208 mg/L and 1.248, 1.148 and 1.416 mg/L respectively. From the results aboved, we could conclude that normal SBR system could be used for treating COD, Zn and Cu

in the wastewater. But, when the HRT and efficiency of the system were considered, SBR-GAC system could be applied for reduction of the HRT and increasing of the efficiency.

**Keywords :** Granular Activated Carbon / Adsorption capacity / Copper / Zinc / SBR / SBR-GAC