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Kinetics of biodegradation of sewage due to addition of chlorides

A B Gupta and T S Rami Reddy

Malaviya National Institute of Technology, Jaipur, India

Presence of salinity 8 to 20 g/L of chlorides can cause osmotic stress or inhibit the reaction pathways in the organic degradation process. It results in a significant decrease in biological treatment efficiency or biodegradation kinetics. Research is carried out using glucose–glutamic acid and domestic wastewater to evaluate the amendment of chlorides on biodegradation of sewage at 20°C. The findings confirm the hypothesis of biological oxidation rate “k” has higher value under presence of up to 6 g/L of chloride concentrations, compared to that of fresh water medium, being almost 25% higher at certain salt concentrations. It was also noticed that improvement of K value was more pronounced during the first 3 days even when the 5-day BOD showed an inhibition, a fact that needs further analysis. These values are of significance for co-treatment of sewage and industrial wastewater containing high salt concentrations. A morphological classification of the bacterial colonies showed that the number of colonies per mL of the sewage sample increased significantly on increasing the salt concentration from zero to 6 mg/L for *E. coli*, *Enterobacter*, *Klebseilla*, *Serratia*, *Citrobacter*, *Salmonella*, *Shigella*, and *Coliform*, however, only *Serratia* was observed to decrease further significantly as the salt level was increased to 8 mg/L.

Biography

A B Gupta holds BE (Civil); MTech and PhD (Environmental Science and Engineering) degrees. He joined MNIT as a Lecturer of Civil Engineering in 1984 and is serving as a Professor since 1996. His assignments include HOD (Civil), Dean R&D and Dean (Faculty Affairs) in the Institute. The major areas of his research are biological waste treatment; environment and health; and environmental modeling. He has published/presented over 270 papers in various international/national journals/conferences, guided seven PhDs and about 80 Masters' theses, taken up several research/consultation projects, and received several academic awards. He has delivered many keynote addresses and invited talks at international/national conferences and institutions. He is a non-official member of RPCB and Environment and Health Board of Rajasthan State and several important committees of DST, GOI.

abgupta.ce@mnit.ac.in