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Process biotechnology application to industrial wastewater treatment plants

Discharge of industrial effluents to inland surface waters is causing damage to natural streams. The polluted natural water streams include river waters, aquifers, ground waters and bore wells. Most of the process industries, like pharmaceutical industries, organic chemical industries, dye industries, bioprocess industries and substituted aromatic industries emanate effluents containing high BOD, high TDS and toxic compounds. This presentation deals with his treatment of wastewaters discharged from nitroaromatic compound wastewaters. The wastewaters from nitro aromatic process industries contain compounds like nitrobenzene, nitrochorobenene, and nitritoluene, which are carcinogenic in nature.

The laboratory studies were carried out on batch and continuous bioreactors to remove the nitro aromatic compounds from the combined wasters. The microorganisms were collected from the soil samples of contaminated site and the mixed culture bacteria were acclimated to the industrial plant wastewaters. Studies were carried out with synthetic samples with same proportions as the combined industrial wastewaters. The solid waste from the process industries were dumped at the state pollution board approved sites. The results are encouraging and particularly the BOD removal efficiencies of anoxic and aerobic bioreactors is above 95% while the BOD removal efficiencies are about 90% with single bioreactors. The initial combined concentrations of nitro aromatic compounds in the effluents varied from 350 to 800 mg/l.

The final treated effluent was confirmed to the stipulated standards given by the state pollution control board. The process biotechnology seems to be a better solution for treating nitro aromatic wastewaters than the chemical and physical methods like solvent extraction and extractive distillation and incineration.

Biography

A V N Swamy has completed his Ph.D at the age of 44years from IIT, Bombay. He is the Vice principal of JNTUA College of Engineering Pulivendula, A.P. India, He has published more than 20 papers in reputed journals and worked as chairman Board of studies for chemical engineering from 2001 to 2005, JNTU. He authored one book on "Fundamentals of Biochemical engineering", BS publications, Hyderabad, 2007. He visited, Clevelnd State University, Cleveland, Ohio, in the year, 2008. He visited AIT Bankok, in 2009 as a part of TEQIP program. He presented a paper at an International conference on waste management, in 2006 at Malta. He reviewed paper for Springer. He worked for about 20 years in various process industries, prior to joining JNTU.

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