

## Reduction of hexavalent chromium in wastewater using hydrogen peroxide

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Treatment and disposal of heavy metals in the industrial effluents, especially in wastewater is a major concern to the environmentalists. One of such polluting heavy metal is hexavalent chromium, Cr (VI), which is emanated from tanning and metal processing industries and is accepted as a carcinogen. The toxic hexavalent chromium is highly mobile whereas its trivalent counterpart, Cr (III) is less mobile and less toxic. Hence treatment of hexavalent chromium requires a reduction process. Most of the chemical reduction processes with subsequent precipitation using zerovalent iron or ferrous sulphate generates a huge quantity of sludge that is difficult to dispose of and causing secondary pollution to the environment. The present research is about reducing hexavalent chromium present in water with hydrogen peroxide ( $H_2O_2$ ) which generates a small amount of sludge; moreover the reducing agent  $H_2O_2$  has no adverse environmental impact. The reduction has been done in batches. The residual concentration of Cr (VI) has been estimated from time to time using a UV-Vis spectrophotometer. Influences of varying process parameters like initial concentration of the substrate, pH, initial dosing of hydrogen peroxide and temperature have been studied. The reduction is more in acidic medium. Increase in initial concentration of the substrate and initial dosing of the reductant increased the initial rate and percent reduction. A rate expression relating initial concentrations of Cr (VI) as well as that of  $H_2O_2$  with the initial rate of reduction has been proposed and validated by experimental results.

### Biography

Ms. Pallavi Mitra has completed her Masters in Environmental Science at the age of 25 years from the University of Calcutta in the year 2008 and currently registered as a PhD student in the Dept. of Environmental Science, University of Calcutta. She has worked as Junior Project Scientist at the Institute of Environmental Studies and Wetland Management, Govt. of West Bengal, India thereafter working as a Project Fellow in a University Grants Commission, Govt. of India, sponsored project in the Dept. of Chemical Engineering, University of Calcutta. She has some publications in both peer-reviewed journals and as conference proceedings.

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