KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
Indian Institute of Science Campus, Bangalore
37th Series of Student Project Programme

Project Report on

"REMOVAL OF HEAVY METALS USING COMBINATION OF ADSORBENTS- A CASE STUDY USING INDUSTRIAL WASTE WATER"

(Sponsored by KSCST)

SUBMITTED BY:

AMITH R.	**1DS10CH006**
DIVYASHRI R.	**1DS10CH013**
DWANI .V. GOWDA	**1DS10CH015**
JOEL BAPTIST	**1DS10CH021**

Under the Guidance of:

Mr. B.S. Thirumalesh
Assistant Professor,
Department of Chemical Engineering

2014

Department of Chemical Engineering
Dayananda Sagar College of Engineering, k.s.layout, Bangalore -78
Affiliated to Visvesvaraya Technological University, Belgaum

SYNOPSIS

Heavy metals are widely used in numerous industries such as paints and pigments, glass production, mining operation, electroplating, battery manufacturing and textile industries. The significant losses of heavy metals occur during the manufacturing processes and these lost heavy metals are discharged in the effluent. As they move from one ecological trophic level to another, metallic species start damaging the ecosystem. They also become difficult to track as they move up in trophic levels. They accumulate in living tissues throughout the food chain. Due to biomagnification, humans receive the maximum impact, since they are at the top of the food chain. Hence heavy metal contamination has been a critical problem.

Adsorption of heavy metals is one of the technique for treatment of waste water containing different types of selected heavy metals. In this study, the adsorbents Coconut shell, Rice husk, Water Hyacinth, Shrimp Shells and Crab shells are investigated as viable materials for removal of Heavy metals. The effect of contact time, particle size and adsorbent dosage are studied. The aim of this study is to use water hyacinth as an adsorbent in removing heavy metal content from industrial waste water and to use the above mentioned adsorbents in combination to see the effect of adsorption. The metal concentrations are determined using Atomic Absorption Spectroscopy. The adsorbents are pretreated by way of cleaning, washing, sun drying and then crushing to obtain particles in different size ranges in order to study the effect of different parameters on the adsorption. The main objective of this project is to use cheap and readily available solid wastes such as Coconut Shell, Rice Husk, Water Hyacinth, Shrimp Shells and crab shells as adsorbents for the removal of heavy metals from the industrial waste water, and to test the effect of contact time, particle size and adsorbent dosage on the extent of adsorption.