

A Major Project Report

On

“A comparative study on different methods of desalination”

Submitted in partial fulfillment of the requirement of the degree of

Bachelor of Technology

In

Chemical Engineering

Submitted by: -

ABHISHEK RAJ, VIVEK MEHTA,

SOHAN SAHU, ARYAN SAHU

Under Guidance of: -

Dr. Raghwendra Singh Thakur

Associate Professor & Head

Department of Chemical Engineering



Department of Chemical Engineering

School of Studies, Engineering & Technology

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) – 495009

CERTIFICATE OF APPROVAL

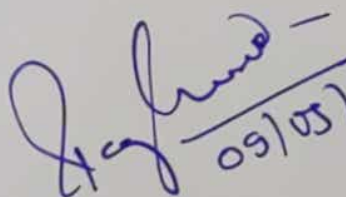
This is to certify that thesis entitled “A Comparative study on different methods of desalination” submitted by Mr. Abhishek Raj (Roll No-19101102), Mr. Vivek Mehta (Roll No-19101149), Mr. Sohan Sahu (Roll No-19101143) And Mr. Aryan Sahu (Roll No-19101106) in partial fulfilment of the requirements for degree of Bachelor of Technology in Department of Chemical Engineering is a record of bonafide and original research work carried out by them under our guidance and the thesis does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar title to them. We further certify that the work reported in this thesis was carried out independently by the candidates.

Approved by

Dr. Raghwendra Singh Thakur
Head Department of Chemical
Engineering
School of Studies of Engineering
& Technology
Guru Ghasidas Vishwavidyalaya,
Bilaspur.

Guided by

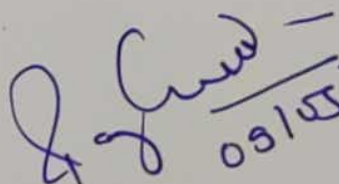
Dr. Raghwendra Singh Thakur
Head Department of Chemical
Engineering
School of Studies of Engineering &
Technology
Guru Ghasidas Vishwavidyalaya,
Bilaspur



09/05/2023

Signature of HOD

विश्वविद्यालय, राधाकृष्ण अकादमिकी
HoD, Chemical Engineering
श्रीमती संजय/Institute of Technology
गुरु गहासिद विश्वविद्यालय, बिलासपुर (उ.प्र.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.E.)



09/05/2023

Signature of Guide

Abstract

In this work desalination of the saline water has been examined. The water sample was taken from Golden Sea Beach which is situated at Puri, Odisha, India. The salinity of the sample was measured to be 38.2 g/L. Literature survey was done to identify the method of treatment of salinity. Silica Gel, Activated Charcoal in granules form and Black Carbon dust in powdered form as adsorbent has been taken in batch adsorption mode to reduce the salinity. Experiment with Activated Charcoal showed that it was possible to reduce the salinity from 38.2 g/L to 30.9g/L when 50 gram of Charcoal at room temperature in 200 mL of water is taken. Black carbon dust showed that it is possible to reduce the salinity from 38.2 gm/L to 14.2 gm/L when 2 gram of Carbon black is taken at room temperature in 200 mL of water. It was possible to reduce the salinity from 38.2 g/L to 20.4 g/L when 2 gram of Silica Gel was taken at room temperature in 200 mL of water in batch adsorption mode.

Evaporation method of desalination has also been examined using a 500 watt electric induction. For evaporation method, 500 mL of water was taken in a pressure cooker (Without the Safety Valve) and heated for 1 hour, the water which was evaporated and condensed showed no salinity and the volume of water thus collected was equal to 460 mL.

Another method named "Two Chamber Electrode System" has also been carried out with one chamber filled with Sea water and other chamber filled with fresh water in the first operation and Potassium Permanganate Solution in second operation. It was observed that when 500 mL of fresh water is taken in 1st chamber and 350 mL of Sea Water is taken in 2nd Chamber at room temperature, the Salinity of water was reduced to 11.1 g/L from 26.5g/L. However, when the 1st chamber is changed with Potassium Permanganate solution and the second chamber is changed with 500 mL of Sea water, it was noted that salinity of sea water got reduced.