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DEPARTMENT OF CIVIL ENGINEERING **29/09/2022**

ACADEMIC YEAR 2022-2023/ODD

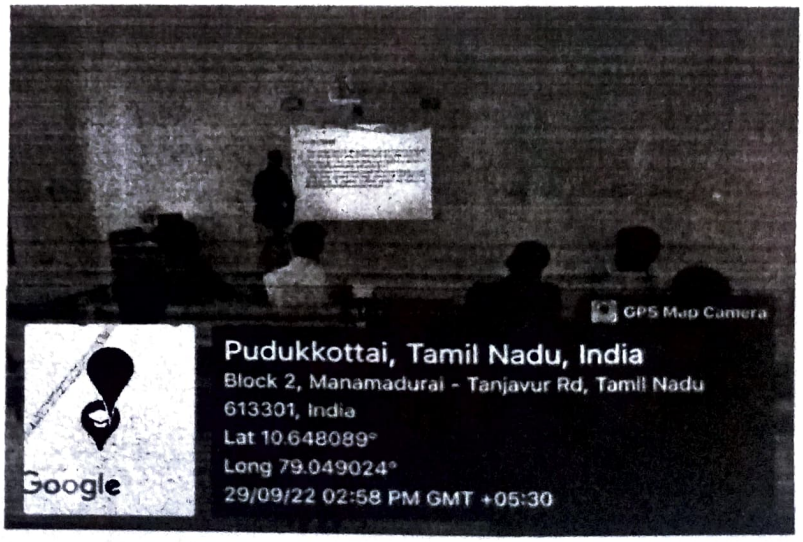
INTERNAL STAFF SEMINAR – REPORT

Background & Objective

Department of Civil Engineering in collaboration with Research and Development section had organized an Internal Seminar for the Department staff members for accessing online journals. The purpose of this seminar is to equip the faculty in new techniques through accessing online journals.

Seminar Session

A Seminar was held in the Department of Civil Engineering on 29th Sep, 2022 at 3:00 P.M. The seminar was presided over by **Dr.R.Saravanan, HoD**. Department of Civil Engineering. All the faculties were present in the seminar. **Ms.S.GAYATHRI/AP** delivered her seminar talk on "**LIBS and PXRF validation for the removal of Pb by bio-CaCo3 nano particles from contaminated water.**"(SPRINGER – Journal of Civil Engineering).



Seminar talk by Ms.S.GAYATHRI, AP/CIVIL

- In this work, laser-induced breakdown spectroscopy (LIBS) was applied to qualitatively evaluate lead adsorbed from industrial wastewater by nano-CaCO3.
- Eggshell as a natural source of CaCO3 has been used as a sorbent owing to its low cost and unrivalled adsorption capacity to remove Pb from contaminated water.
- The structure and morphology of CaCO3 nano-powders were investigated using scanning electron microscopy (SEM), transmission electron microscope (TEM) and Fourier transforms infrared (FTIR).
- LIBS results were experimentally validated by the results obtained using portable X-ray fuorescence spectroscopy (pXRF) and energy dispersive X-ray (EDS), which confrmed the feasibility of using LIBS to detect traces of Pb ions, while the adsorption process is applied under governing parameters.
- Langmuir and Freundlich isotherm models were used to model the experimental data.
- The kinetics of adsorption mechanisms were studied using Lagergren's pseudo-first-ord and McKay and Ho's pseudo-second-order.
- The obtained results demonstrated that bio-CaCO3 nanoparticles could be used as an effective lead-sorbent from wastewater.
- Accordingly, it is possible to utilize this adsorption technique as a promising practical approach for the treatment of lead-contaminated industrial wastewater and its recirculation.

Outcome

~~The Seminar clearly highlighted the~~ In this work, LIBS (a spectrochemical analytical technique) was exploited to monitor the removal of Pb (a toxic heavy metal) from contaminated water via bio-CaCO3nanoparticles. The economically natural source eggshell, was dried and ground to nanosize to be used as a discriminative sorbent to remove Pb from water. The effciency of eggshells in the adsorption of heavy metals is due to the presence CaCO3 as the main component, which has unrivaled adsorption capacity to remove heavy metals through ion exchange reactions with calcium ions. All LIBS results were confirmed using the pXRF and EDX techniques. Discussions were made among faculties in various new techniques. Staff members shared their views regarding seminar and gave their feedback.

From this paper I have understood the various new tests to for removal of Pb by bio-Caco3 nano particles from contaminated water.

17/10/2022

HOD/CIVIL

18/10/2022

PRINCIPAL