

ECO-EFFICIENT RECOVERY OF WASTES FROM HOT DIP GALVANIZING PROCESS AS ANIONIC CLAYS APPLICABLE FOR REMOVAL OF UNDESIRABLE COMPOUNDS FROM WATER

Goal of the project

The main objective of the project is the synthesis of anionic clays (layered double hydroxides) from wastes of hot dip galvanizing process (zinc ash and sludge from wastewater treatment) and the utilization of these materials in removal processes (adsorption or photocatalysis) of undesirable compounds from water (i.e. phenols, dyes, chromate). Another objective is to gain significant research experience for the project team.

Short description of the project

By treatment of industrial wastes some layered double hydroxides (LDH) will be prepared. The correlation between the chemical characteristics of precursors of LDH obtained from wastes and the performances of LDHs in removal processes of undesirable compounds from water will be clarified.

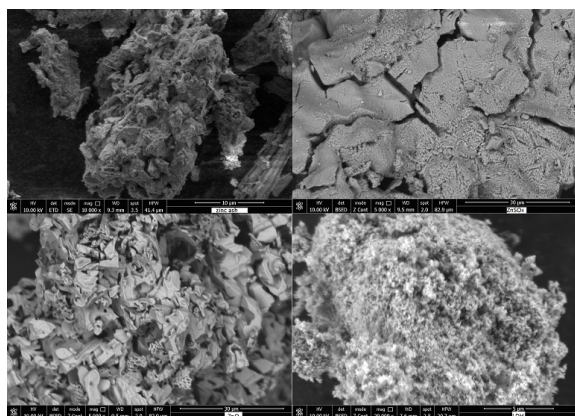


Figure 1. SEM images of zinc ash and product obtained after zinc ash treatment ($ZnSO_4$, ZnO and LDH)

Project implemented by

Faculty of Industrial Chemistry and Environmental Engineering

Implementation period

01.10.2015 – 30.09.2017

Main activities:

1. The influence of the working parameters of wastes treatment process on the chemical characteristic of the obtained metal solutions;
2. The influence of the chemical characteristics of solution precursors on the morphological and surface properties of the synthesized LDH;
3. The performances of the synthesized LDH in the sorption and photocatalytic processes for removal of undesirable compounds from water.

Results

1. Method for valuable metal recovery from wastes of hot dip galvanizing process.
2. New method for anionic clay synthesis from metal ions recovered from wastes of hot dip galvanizing process.
3. Method for removal of undesirable compounds from water by anionic clays synthesized from wastes of a "dirty industry".

Applicability and transferability of the results

By applying this approach, the wastes of a "dirty industry" (hot dip galvanizing process) are treated and a valuable product is added, keeping in mind that the anionic clays have multiple utilizations at industrial scale as plastic additives, as flame retardant and as anions scavengers. The project has an interdisciplinary character presenting an integrated concept of industrial wastes treatment and waters depollution.

Financed through/by

Romanian National Authority for Scientific Research and Innovation, CNCS - UEFISCDI

Research Centre

Research Institute for Renewable Energy

Research team

Assist.Prof. Laura Cochechi, PhD

Lecturer Lavinia Lupa, PhD

Lecturer Marius Gheju, PhD

Eng. Delia Andrada Duca, PhD student

Eng. Alin Golban, PhD student

Contact information

Assist.Prof. Laura COCHECI, PhD

Faculty of Industrial Chemistry and Environmental Engineering/
Department of Applied Chemistry and Engineering of Inorganic
Compounds and Environment

Address: Vasile Parvan Bl, No. 6, 300223, Timișoara

Phone: (+40) 256 403069

E-mail: laura.cochechi@upt.ro

Web: <https://sites.google.com/site/pniirute20140771/>