Investigation of the process of wastewater treatment from heavy metals by slag sorbent

Master st. Mykyta Prybieha, Supervisor Dr . Liliya Frolova, Ukrainian State University of Chemical Technology , Ukraine

The aim of this work was to investigate the possibility of wastewater treatment containing heavy metals to obtain pigments using blast furnace slag.

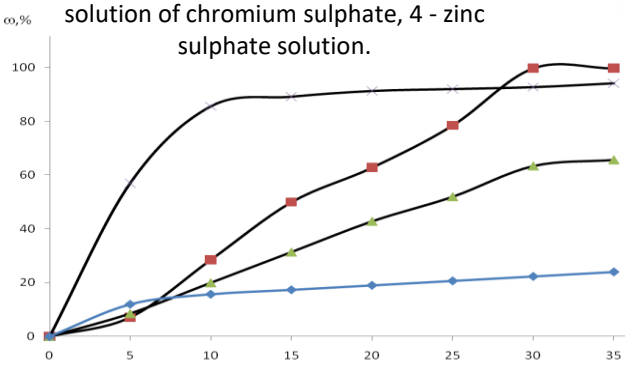
Introduction:

Heavy metals are widely used in various industries. They are classified as highly toxic substances that are especially dangerous for the environment, for example Cr, Fe, Co, Cd, As, Ni, Hg, Pb, Zn. Wastewater from leather, pickling and electroplating industries must be cleaned of heavy metal ions before being discharged into water bodies.

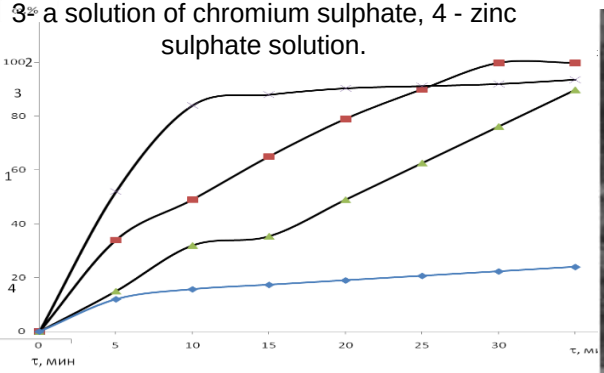
Conclusions:

Thus, as a result of the study, it was found
1) that the degree of wastewater treatment from heavy metals was 75-98% of concentrated wastewater.
2) it is possible to obtain green and brown pigments based on blast-furnace slag
3) an important parameter of the process is the nature of the cation of the polluting substances and the dispersed and phase composition of the slag, since the rheological properties of the pigment depend on it. These patterns produce pigments ranging from light olive to dark green by varying the synthesis parameter.

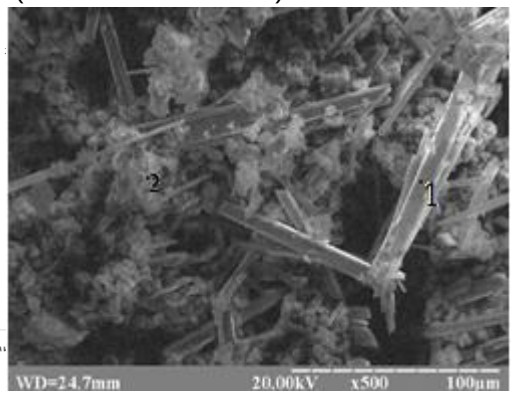
The dependence of the concentration of heavy metal cations from time: 1 -solution of ferrous sulfate, 2-nickel sulfate solution,3-a solution of chromium sulphate, 4 - zinc sulphate solution.



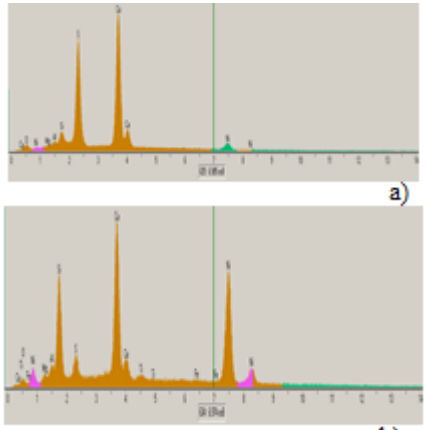
The dependence of the concentration of heavy metal cations from time: 1 solution of ferrous sulfate, 2-nickel sulfate solution, 3- a solution of chromium sulphate, 4 - zinc sulphate solution.



The microphotograph of the particles of the sorbent on the basis of blast-furnace slag (nickel sulfate solution)



Elementwise composition of the sorbents (a-phase 1, b-phase



"EcoMining: Development of Integrated PhD Program for Sustainable Mining & Environmental Activities"