

Brief information about the project

Name of the project	AP19178014 “Development of electrolyzer for purification of recycled and wastewater from chromium (VI) by electrocoagulation for the chromium industry of Kazakhstan”
Relevance	One of the important areas of industry in Kazakhstan is the mining and processing of chromite ores. At some secondary stages of the technologies used, soluble forms of particularly toxic, mutagenic hexavalent chromium are formed, the leakage of which causes significant damage to the flora and fauna of the surrounding area, as well as to the health of people living in the Aktobe region. Treatment of recycled and wastewater and highly reactive dust of this production would improve the environmental situation of this region.
Purpose	Optimization of the method of TNK Kazchrome JSC's wastewater treatment from chromium (VI) by electrocoagulation and to create a cheap and efficient pilot electrolysis treatment plant.
Objectives	A) Optimization of the significant parameters of electrolysis to produce electrolytic coagulant. B) Determination of the wastewater composition influence on electrocoagulation process. C) Electrode material selection. D) Design and construction of a pilot electrolyzer.
Expected and achieved results	In this project, optimization of an electrolyzer for the treatment of recycled and wastewater in the production of ferrochrome will be carried out. All electrolysis parameters for the generation of an electrolytic coagulant will be optimized by varying the current density, temperature, mixing mode and flow, and their effects on efficiency and on the kinetics of reduction and sorption of chromium (VI) will be studied. The influence of wastewater parameters (chromium (VI) concentration, the presence of interfering components, pH, electrical conductivity) on the electrolysis process and the residual concentration of chromate and bichromate anions after treatment will also be determined. The choice of electrode materials for stable operation of the cathode and an electrochemically soluble anode to produce an electrolytic coagulant will be carried out. Based on these developments, the design and construction of an experimental electrolyzer for laboratory enlarged tests will be carried out (the optimal shape of the structure, the dimensions of the electrolyzer and electrodes, the establishment of the optimal flow regime of the treated waters, etc.). Based on the results obtained, it is planned to publish at least 2 (two) articles in journals from the first three quartiles by impact factor in the Web of Science database or having a CiteScore percentile in the Scopus database of at least 50.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if	PhD Saule Kokhmetova (WoS , Scopus). Scientific supervisor is doctor of chem.sci., professor Andrey Kurbatov (ResearchID , GoogleScholar , ORCID , M-6232-2019)

available) and links to relevant profiles	
List of publications with links to them	-
Patents	-