

Brief information about the project

Name of the project	Development of polymer self-healing coatings containing natural inhibitors to protect steel from corrosion
Relevance	Polymer intelligent self-healing coatings, which are the focus of this project, represent a promising solution to the global problem of corrosion.
Purpose	This project aims to develop a conductive anticorrosion nanocomposite epoxy coating on the surface of steel containing halloysite and a natural inhibitor, tannin.
Objectives	One of the primary objectives of the project is the extraction of tannins from the bark of Kazakh oak, the fabrication of conductive nanocomposite coatings containing tannin-loaded halloysite nanotubes on the steel surface, and the investigation of their protective properties using salt spray and electrochemical methods, as well as conducting mechanical testing of coated steel samples under laboratory conditions.
Expected and achieved results	Tannins have been successfully extracted from the bark of Kazakh oak. Nanocomposite coatings based on halloysite have been obtained. Experiments to evaluate the protective properties of polymer nanocomposite coatings using electrochemical methods have been initiated.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	Burkitbayeva B.D. – project PI (Scopus ID: 56436895700, ORCID: 0000-0002-9113-4471, Researcher ID: A-7107-2015). https://www.scopus.com/authid/detail.uri?authorId=56436895700 Argimbayeva A.M. – Leading researcher (Scopus Author ID: 56436828200, ORCID: 0000-0002-2467-8241, Researcher ID: AAQ-3743-2020). https://www.scopus.com/authid/detail.uri?authorId=56436828200 Adeloye Adewale –Researcher (Scopus Author ID: 365978657006, ResearcherID: I-6046-2019, https://orcid.org/0000-0003-1736-5738). https://www.scopus.com/authid/detail.uri?authorId=36597865700 https://www.webofscience.com/wos/author/record/I-6046-2019 Beisenova G.S. – Researcher (ResearcherID: D-5783-2015, ORCID: 0000-0002-6751-9451, Scopus author ID: 57207202159). https://www.scopus.com/authid/detail.uri?authorId=57207202159 Jumanova R. – Researcher (Scopus ID: 57188622123, ORCID: 0000-0003-3826-3474, Researcher ID AAS-6004-2020). https://www.scopus.com/authid/detail.uri?authorId=57188622123 Bakhytzhan Ye.G. – Researcher (Scopus ID: 57221333561, ORCID: 0000-0002-3217-5927, Researcher ID: AAS-4650-2020). https://www.scopus.com/authid/detail.uri?authorId=57221333561
Usage	The project results can be applied to enhance the durability of metal structures in industries such as oil and gas, construction, and transportation by using polymer self-healing coatings with natural inhibitors. These materials will reduce maintenance costs, improve environmental safety, and minimize corrosion-related losses.
Priority compared to real-world alternatives	A key priority task is the extraction of tannins from the bark of Kazakh oak and the development of environmentally friendly self-healing coatings.

List of publications with links to them	No
Patents	No