

Brief information about the project

Name of the project	AP13067724 «Innovative remediation strategy for toxic mercury species in the area of the former Pavlodar chemical plant»
Relevance	The project is expected to develop an innovative strategy for remediation of the area of the former Pavlodar chemical plant from mercury toxic forms using data on occurrence of mercury species (including methylmercury, mobile and bioavailable forms). These forms, determined by modern physicochemical and analytical methods, will help to assess the Hg mobility, toxicity and the ability to methylation at this location and will make it possible to propose a rational approach to remediate the territory. In addition, it is planning within the project to develop and offer for commercial use at least one material/product as an in-situ amendments to stabilize/immobilize mercury in soils and/or to remove it from water.
Purpose	Determination of mercury species in environmental samples collected in the vicinity of a chemical plant (Pavlodar) to assess its mobility/bioavailability and select an effective remediation strategy.
Objectives	<p>Objective 1. To identify the mercury forms (including methylmercury) in water samples, sediments and soils sampled in the vicinity of the former chlor-alkali plant (Pavlodar);</p> <p>Objective 2. To make an assessment of the degree of water purification from mercury using eggshells as a sorbent;</p> <p>Objective 3. To conduct the lab-based experiments to assess the degree of mercury stabilization in the soil by treating with sulfur-containing materials (including nanosulfur).</p>
Expected and achieved results	<p>1. The total content of mercury and its forms, including methylmercury (MeHg, % MeHg of THg), mobile and bioavailable, in various environmental objects will be determined. These will make it possible to determine the Hg mobility, toxicity and the availability to methylation in the environment impacted by the former chlor-alkali plant activity (Pavlodar). Transfer factors in the following systems water-sediments, soil-plants will be determined.</p> <p>2. Optimum conditions will be obtained for purifying water from mercury by sorption and for stabilizing mercury in the form of an insoluble form of HgS, which is also less susceptible to volatilization. At least one material/product will be elaborated and offered for commercial use as in situ amendments to stabilize mercury in soils and/or to remove it from water.</p>

	<p>3. Recommendations will be given on further monitoring of the environment in the contaminated sites and on technology for cleaning up the area.</p> <p>4. Advanced training of young scientists (it is expected to hold 1 scientific seminar, 1 practical seminar, and the preparation of 1 one PhD doctor).</p>
<p>Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles</p>	<p>Satybaldiyev, Bagdat ORCID: https://orcid.org/0000-0003-3434-7291 Scopus Author ID: 55970118000 ResearcherID: DOP-7533-2022</p> <p>Uralbekov Bolat ORCID: http://orcid.org/0000-0002-3245-4096 Scopus Author ID: 36664090200 ResearcherID:IRW-8210-2023</p> <p>Kenges Kairat ORCID: https://orcid.org/0000-0001-6408-6083 Scopus Author ID: 57197734961 ResearcherID: AAV-5793-2020</p> <p>Ismailov Baimurat Scopus Author ID: 57999127600 ResearcherID: HKX-5523-2023</p>
<p>List of publications with links to them</p>	-
<p>Patents</p>	-



