

Kingston upon Thames 8th May 2025

Foreign consultant's review of Kunarbekova Makhabbat Seit-Zadayevna's
work on

**«Preparation of modified carbon materials for the removal of
radionuclides from contaminated water»,
presented as part of the dissertation defence for the Doctor of Philosophy
degree in the field of «8D07109 - Innovative technologies and new inorganic
materials»**

It has been a great satisfaction to co-supervise and serve as foreign scientific consultant of Ms Kunarbekova Makhabbat Seit-Zadayevna's (Makhabbat). She has been one of the best PhD students I have ever had. She has excellent scientific and personal skills and has achieved the level of a PhD.

The research work in this PhD has involved the preparation of activated carbon from different sources of biomass; their derivatisation into novel materials which have acquired high added value; their characterisation with diverse complementary techniques and their use, for cleaning water, in model solutions in the laboratory as well as in real water effluents from a nuclear plant, which increases the technology readiness and significance of the work.

Most of the experimental work has been carried out at Satvayev University. However, the PhD candidate travelled to Maria Curie-Skłodowska University in Lublin to carry out radiochemical work, and to Kingston University (Greater London) to carry out part of the characterisation of the carbons.

Although the conceptualisation of the work was done by the supervisory team, Ms Kurnekova took ownership of the work very early on and has been leading on the different lines of research of her PhD. The result is that the novel materials that she has developed are showing competitive effectivity for the removal of iodine and caesium ions, even in industrial water effluents from the nuclear industry. The mechanisms of their uptake have been investigated which has generated new knowledge and the understanding of how to make the materials better and adapt them for a broad range of water effluents.

So far, Ms Makhabbat Kunarbekova has published a book chapter and a literature review with me in a Q1 journal. Also with me, she is finalising a research paper that we would like to submit to the journal Carbon.

I have been a visiting researcher at Satvayev university in August/September 2025 and we worked on the PhD candidate presentation skills during that time. I observed how she presented her work in front of several international audiences with great success.

Based on the results of this PhD, I estimate 2 additional papers in Q1 journals will be published in 2025 and 2026. Specifically these will be on the uptake mechanisms of iodine by the derivatized carbons; and on the mechanisms uptake of Cs and other radiochemicals with the novel materials developed.

Ms Makhabbat Kunarbekova's research effort has resulted in opening a new research line at Satvayev university and collaboration with the nuclear industry on a topic that is at the heart of 6th Sustainable Development Goal

I feel proud of the high academic level achieved by Ms. Kunarbekova Makhabbat Seit-Zadayevna, and I congratulate her and the University on her continued outstanding achievements.

Sincerely,



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