Review of: "Neutronic Chain Reactions for Polonium-210 Production"

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Potential competing interests: No potential competing interests to declare.

Review Report

In the paper titled 'A Novel Nuclear Chain Reaction for Efficient Polonium-210 Production,' the authors present a groundbreaking discovery that offers a promising solution for the cost-effective production of polonium-210, an industrially significant radionuclide. The traditional method of producing polonium-210, involving neutron irradiation of bismuth metal and the subsequent beta decay of bismuth-210, is known for its inefficiency due to the small neutron capture cross-section of bismuth-209. The authors introduce a previously undescribed self-sustaining nuclear chain reaction that takes place in bismuth salts, demonstrating an innovative approach to overcome the limitations of conventional polonium-210 production.

The manuscript is generally well-written and provides a detailed description of the study. The results, especially Figures 9 and 10, are also quite convincing. However, a notable issue is that the authors refer to 'appendix 1 & 2' (at least on three occasions), which is essential for providing additional information and data. Unfortunately, this section (appendix) was not found in the manuscript. It's essential to ensure that all necessary supporting materials, such as appendices, are available to accurately evaluate the research's validity and completeness.