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Rhenium and Iridium Targets Prepared Using a Novel Graphene Loading Technique

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For accelerator targets, graphene films are an excellent material choice due to their high thermal conductivity, high temperature tolerance, low outgassing, mechanical integrity, and ease of handling. A variety of targets have been produced using graphene material as a backing or a host matrix. One of the unique advantages of the graphene film fabrication process is the capability to embed target materials, including refractory metals, in the nanoparticle form into a host graphene matrix during target preparation. Targets of natIr and natRe have been fabricated as nanoparticle loaded graphene targets for use in nuclear physics research.
We hope to obtain beam time to evaluate target performance as well as production yields and nuclear decay properties via the natRe(a, 2n)186Ir and natIr(a, 3n)194Au reactions, respectively. These rhenium and iridium targets will be irradiated using the ATLAS accelerator and gamma rays measured in-place using the high-precision gamma-ray spectroscopy capabilities of Gammasphere and further analyzed using a multi-parameter detector system. Future plans include the preparation of isotopic targets of these two elements.

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