

Public Abstract

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Title:Cyclotron Produced Nuclides for PET Imaging and Radiotracer Studies

Sucrose was labeled at three different positions with radioactive fluorine, F-18, and applied to corn plants to study the transport of sugar in maize and to better understand the basic transport mechanism. The transport of sucrose in wild-type and mutant, lacking the primary sucrose transporter, plants were compared to each other and to sucrose labeled with carbon-14. It was found the fluorosucrose analogues compared well with the carbon-14 sucrose and a distinct difference was observed between the wild-type and mutant maize plants.

The simultaneous production of copper-64 and zirconium-89 on a medical grade cyclotron, particle accelerator, was also explored. The targetry of the solid target holder of the cyclotron was modified by replacing a Havar window with a yttrium foil. This allowed for the production of zirconium-89 at the yttrium foil while allowing the enriched nickel-64 target to remain in the solid target holder for the production of copper-64. Zirconium-89 was produced, separated, purified and labeled with results similar to previous publications by other authors. The copper-64 production was enhanced by fifty percent when the yttrium foil was replacing the Havar window when compared to a database of over 40 productions at the Missouri University Research Reactor, MURR. The copper-64 was also separated, purified and labeled successfully by researcher at MURR.