

Public Abstract

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Department:Chemistry

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Title:Technetium from Two Perspectives: Sulfide Remediation and Schiff Base Chemistry

Two major areas of focus in radiochemistry are environmental and pharmaceutical. This work looks at technetium-99 (Tc-99) chemistry from both viewpoints.

The Manhattan Project led to millions of gallons of radioactive waste. The waste is stored at containment facilities and has begun to leak into the environment. A key component of this waste is Tc-99. This work investigates a method using hydrogen sulfide to treat Tc-99 in the environment and possible organic interferences that may occur from the treatment. It was found that using hydrogen sulfide to remediate Tc-99 in soil could lead to water stable products under certain conditions. However, interactions with iron-containing minerals could greatly reduce this interference.

Aside from being an environmental concern, technetium is better known for its use as a medical imaging agent. The second portion of this project investigates potential diagnostic imaging agents. This work lead to unusually stable complexes which could benefit radiopharmaceutical development for technetium.