

Enhancement of the Undergraduate Nuclear and Radiochemistry Curriculum through the Development of Radiochemistry Laboratory Experiments

Executive Summary

Our goal is to develop new experiments in radiochemistry that will enhance the undergraduate nuclear and radiochemistry curricula. We hope to develop procedures that can be used by educators to introduce nuclear and radiochemistry concepts throughout the undergraduate chemistry curriculum. We have a new radiochemistry laboratory, and the focus of the project is to upgrade the instrumentation we have to modern standards so the experiments we develop can be introduced to our nuclear and radiochemistry course and shared with other institutions.

What we plan to do in this project is to create laboratory experiences in radiochemistry through the development of experiments that fit into the traditional 3-hour undergraduate laboratory period and uses exempt quantities of radionuclides and natural sources of radioactivity (minerals, soils, and commercial products.) The emphasis on these experiments will be on radioactivities that can be measured by Geiger counting but liquid scintillation counting and solid state detection will also be used, where appropriate. We would also like to develop a series of modern solvent extraction experiments that are applicable to the nuclear fuel cycles and monitoring of radionuclides in the environment.

It is important to note that all experiments developed by this project will be accompanied by safety and waste disposal information. Dissemination of the experiments developed would be through presentation at national and regional American Chemical Society meetings, the development of a web site with the experimental procedures and results, and through personal contact with colleagues in the field.

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