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Radiochemistry Education: Combining Fundamental and Applied Studies

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Technetium and the actinides are radioelements of importance to the nuclear fuel cycle. Compounds composed of these elements are used in nuclear fuel, separations, safeguard applications, and isotope utilization. These radioelements also represent an underexplored section of the periodic table. Studies on compounds with technetium and the actinides provide opportunities to expand basic chemical knowledge, particularly when coupled with computational studies. Performing experiments with these elements requires specialized facilities and radiochemical expertise. The training of students and scientific rewards for examining this relatively unexplored area of the periodic table are worth the intrinsic difficulties associated with experiments using these elements. The radiochemistry program at the University of Nevada, Las Vegas is described, with emphasis given to the facilities, education mission, and collaborations. The linkage of the UNLV radiochemistry program with DOE and international research efforts is presented. Examples are provided on separations, fuel synthesis, and waste form studies. The incorporation of internet lectures with a laboratory intensive program for undergraduates is also described. The undergraduate program has been demonstrated as an effective pipeline for student recruitment to graduate programs.

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