

RAPID METHOD TO DETERMINE ACTINIDES AND SR-89/90
IN LIMESTONE AND MARBLE SAMPLES

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Limestone and marble have been used in many important buildings and monuments in the U.S, including the Pentagon, the Lincoln Memorial, the Washington Monument and the Empire State Building. If a radiological emergency such as a ‘dirty bomb’ or nuclear accident occurs that impacts these types of buildings, there will be an urgent need for the rapid analysis of limestone and marble samples. The radiochemical measurements need to be rapid and reliable to support dose mitigation and environmental clean-up. There is the potential for refractory particles to be present, so rugged sample digestion is needed. A new method for the determination of actinides and Sr-89/90 in limestone and marble samples has been developed that utilizes a rapid sodium hydroxide fusion to digest the sample. Following rapid pre-concentration steps, actinides and Sr-89/90 are separated using extraction chromatographic resins to collect and purify the radionuclides for assay. Challenges associated with the high calcium content in limestone and marble will be addressed. This approach has a sample preparation time for limestone and marble samples of <4 hours.