

TYPICAL REMOVAL EFFICIENCIES FOR RADIOACTIVE
IODINE/IODIDE FOR CHARCOAL AND SILVER ZEOLITE CARTRIDGES
UTILIZED IN RADIATION PROTECTION APPLICATIONS IN
NUCLEAR ENERGY INSTALLATIONS

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ABSTRACT

The removal efficiencies of radioactive methyl iodide for charcoal and silver zeolite cartridges utilized worldwide in nuclear installations to determine concentration levels of radioactive iodine/iodide in work areas, plant containment atmospheres and gas storage vessels are determined as a function of flowrate, particle size, and sample duration.

A comparison of silver zeolite adsorbents and activated charcoal adsorbents (with Triethylenediamine impregnation) is made. A comparison of the pressure drop across the filter as a function of adsorbent mesh size and flowrate is made to assist in evaluating the compatibility of the adsorbent mesh size with air sampler operating specifications.

The study has been conducted utilizing the standard test method ASTM D3803, 1979 to achieve a relationship of these data to performance requirements mandated by the USNRC for nuclear grade adsorbents utilized in nuclear power plant air cleaning systems.

Equations for removal efficiencies for Methyl Iodide (CH_3I) as a function of flowrate are determined utilizing a computer program and graphically illustrated to facilitate the identification of trends and efficiency differences due to mesh size, type of adsorbent, sample duration and flowrate.