Release of uranium and emission of radiation from uranium-glazed dinnerware

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ABSTRACT/EXCERPT

Abstract

Samples of orange, yellow, beige, ivory and blue-green ceramic dinnerware glazed with uranium compounds have been examined. Measurements at glaze surfaces yielded exposure rates of 3.8–16 mR/h (1–4 µC/kgh) for orange glazes and rates of 0.04–1.3 mR/h (0.01–0.3 µC/kgh) for ivory beige, and yellow glazes. Whole body exposure from a shelf display of 40 orange dishes was estimated to be 0.1–0.5 mR/h (0.03–0.13 µC/kgh), or up to 50 times the room background radiation level, at a distance of 1 meter. Twenty-four hour leaching tests of orange, yellow, and ivory dishes were carried out with various concentrations of acetic and citric acids. Uranium concentrations in leachates of some orange dishes exceeded 450 mg/l. Uranium is a chemical nephrotoxin and the United States Environmental Protection Agency has proposed a maximum contaminant level for drinking water of 0.020 mg/l. Based on this value a person consuming, 2.2 l of drinking water per day would ingest 0.31 mg of uranium per week. A person eating once a week from an orange glazed dish could easily ingest 10 or more times this amount.

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Table of gamma rays from fission products

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