

Zerwekh

OFFICE MEMORANDUM

TO : Tom Keenan, H-7 Group Leader, MS 518 DATE: 29 August 1975
THRU : R. D. Baker, CMB-Division Leader, MS 756
FROM : G. R. Waterbury & Al Zerwekh
SUBJECT: TRANSURANIC WASTE & DEVELOPMENT PROGRAM(A412) MONTHLY
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Report

Analytical Chemistry

Radiolysis Studies: Data obtained for the compositions of the initial gas samples and from monitoring ^{238}Pu -contaminated homogeneous waste in retrievable storage at LASL show that very little gas was generated, even at the high temperatures attained in summer (Table I). These data were obtained from two drums, 255 and 260, recently placed in storage and instrumented. Judging from the negligible gas generation, one must conclude that the ^{238}Pu oxide contaminant is concentrated in a small volume of the waste matrix.

Pressure is increasing at the rate of 3.47 kPa/d in the cylinder containing Duoseal on Vermiculite contaminated with 62 mg $^{238}\text{PuO}_2$. In the companion cylinder which is contaminated with 31 mg $^{238}\text{PuO}_2$, the pressure increase is 2.34 kPa/d. The latest gas samples from these experimental cylinders had the compositions shown in Table II. It is clear that the hydrogen production from this material is significant and increasing. This does not necessarily preclude storage of contaminated oils in this manner, but it suggests that the containers should be vented through a suitable filter and the gas allowed to diffuse into the atmosphere.



TABLE I

Data from ^{238}Pu -contaminated Waste in Covered-Trench Storage

Drum Number	^{238}Pu Content g	Waste Content Kg	Days in Storage	Temperature, °C			Soil Under Cask	Sample With- drawn From	Gas Composition (Mol %) *					
				In- side Drum	Out- side Drum	Ambient			H ₂	CH ₄	O ₂	CO ₂	CO	N ₂
255	19.9	20.0	(Jul) 44	34.5	26.0	28.0	20.0	DRUM	<0.1	<0.1	19.0	0.9	<0.1	0
								CASK	<0.1	<0.1	19.0	0.1	<0.1	79.0
260	20.2	13.6	(Jul) 48	47.0	26.0	28.0	20.0	DRUM	<0.1	<0.1	18.0	0.8	<0.1	80.0
								CASK	<0.1	<0.1	20.0	0.1	<0.1	79.0

*In addition, traces of organics were found in both drum and cask gas mixtures.