



Pa<sup>231</sup> 5.00-5.05 / ~6070j  
Pa<sup>239</sup> 5.15-7 (7375)

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ARGONNE NATIONAL LABORATORY

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Main worry of  
<sup>231</sup>Pa content is  
interference in  
<sup>239</sup>Pa peak; even  
<sup>242</sup>Pu traces can be  
big enough to  
make small <sup>231</sup>Pa  
inconspicuous.

Mr. Evan E. Campbell  
Bio-Analytical Chemical Section  
Industrial Hygiene Group  
Los Alamos Scientific Laboratory  
Los Alamos, New Mexico 87544

Dear Evan,

Attached is a summary of the data obtained in the analysis of the urine samples. It is my conclusion that within the statistics of counting the values obtained by LASL and ANL for daily <sup>239</sup>Pu excretion rates are, with but one exception, in agreement.

The small relative difference between the sums of our values and the sum of your values may indicate a small bias in one of the laboratories. I may have an explanation for this. Robert Oldham, who took over this analysis after Pat Starzyk left, recently ran a large reagent blank and the results indicate that there is a small amount of <sup>231</sup>Pa in one of our reagents. Since this nuclide is, to some degree at least, following the plutonium in the procedure that we use and emits alpha particles whose energies are at very nearly the same energy as the principle alpha from <sup>242</sup>Pu, it is quite conceivable that this is an explanation for the small difference. The <sup>242</sup>Pu counts obtained from our alpha spectrograms probably include a small number of <sup>231</sup>Pa counts. However, due to the intractable nature of protactinium chemistry, we can't be sure that the amounts of <sup>231</sup>Pa in each plutonium fraction was constant. At the present time I don't intend to pursue this problem further, that is, identify the specific reagent. The problem is, however, worthy of note as <sup>231</sup>Pa might in some other determination be a significant interference.

Your cooperation in carrying out this program is greatly appreciated. I have been very pleased by the close agreement of the results.

Sincerely yours,

Robert P. Larsen  
Radiological and Environmental  
Research Division

hmb

cc: J. Rundo / R. Oldham  
A. Stehney / J. Sedlet

Summary of ANL and LASL  
 Values for <sup>239</sup>Pu Urinary Excretion Rates

<u>Sample No.</u>	<u>Day</u>	<u>pCi/Day</u>		<u>LASL</u>
		<u>ANL</u>	<u>LASL</u>	<u>ANL</u>
942	1	7.63	7.93	1.03
943	2	8.96 <sup>i</sup>	7.71	0.86
944	3	8.22	9.00	1.09
945	4	7.91	7.67	0.97
946	5	7.63	7.25	0.95
947	6	7.72	8.82	1.21
948	7	7.47	6.12	0.82
949	8	7.38	9.00	1.22
950	9	6.59	10.02	1.52
951	10	7.37	8.33	1.13
952	11	8.41	9.59	1.14
953	12	7.77	8.23	1.06
954	13	6.09	5.66	0.93
955	14	8.05	8.37	<u>1.04</u>
			Average	1.03 (without 950)
				1.06 (with 950)
1146	1	4.62	5.36	1.16
1147	2	3.94	4.57	1.16
1148	3	4.56	4.65	1.02
1149	4	5.33	5.44	1.02
1150	5	4.42	4.11	0.93
1151	6	4.90	5.39	1.10
1152	7	5.35	5.78	1.08
1153	8	4.46	4.15	<u>0.93</u>
			Average	1.05

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