calculated as

$$\Sigma^P = 22.0\,x\,[H] + 10.0\,x\,[N] + 3.8\,x\,[O] ,$$

where the variable in brackets denotes the number density of nuclide x in at./b-cm. The cross-section set for each plutonium isotope is chosen according to the value of the ratio of Σ^P to the plutonium isotope number density. Interpolation was used when the calculated ratio fell between two tabulated values. The average value of k_{eff} for the data shown in Table II is 1.0107 ± 0.0108, with no apparent drift in k_{eff} as a function of solution concentration.

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Comments on "Calculations on Raschig-Ring-Poisoned Plutonium Solution Systems Using Hansen-Roach Cross Sections"

We were pleased to note the good results obtained by Dickinson[1] in calculating criticality for some of our plutonium nitrate Raschig-ring-filled vessels[2] utilizing Hansen-Roach cross sections. Use of the formula provided for macroscopic potential scattering cross sections, with interpolation when the calculated ratio falls between two tabulated values, provides very good results and attests to the quality of the experiments.

In the data analysis, our purposes were not so much directed toward evaluation of cross-section sets *per se*, but rather to examine a few methods of treating the Raschig rings. The method used to mock up the random array of Raschig rings for the purposes of carrying out the calculations is to be emphasized and is of principal concern. In our treatment, good results can be obtained with the Monte Carlo calculations by treating the Raschig rings as parallel vertical tubes displacing the same volume of solution as the rings with the neutron cross sections of the rings being averaged over the neutron energy spectrum characteristic of the plutonium solution. Going to greater complexity, such as splitting the parallel tubes into short sections of length equal to the Raschig rings, with gaps between each, did not improve the results. This latter information was not included in the original paper.

TABLE I

Plutonium Concentration (g Pu/liter)	k_{eff} Using KENO-II[a,b,c]	
	ENDF/B-III	GAMTEC-Library
391	1.022 ± 0.006	1.012 ± 0.006
197	1.032 ± 0.006	1.001 ± 0.006
63	0.990 ± 0.006	0.978 ± 0.005

[a]ENDF/B-III data were processed using the FLANGE-ETOG codes.

[b]Raschig-ring cross sections averaged over the neutron energy spectrum characteristic of the respective plutonium solution.

[c]Equal-volume vertical-tube model.

One of the principal purposes of the paper was to present experimental data for use in validation of cross sections and calculational methods. Because of the apparent sensitivity of poisoned systems to plutonium concentration, the validity of the calculational method and cross sections to be used should always be checked in the concentration range that is of interest. Since the original paper was presented, some additional calculational correlations, which may be of further interest, have been made using evaluated nuclear data file cross sections (ENDF/B-III version) with 18 energy groups (Table I). Comparison is made with values presented in the original paper.

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[2]R. C. LLOYD, S. R. BIERMAN, and E. D. CLAYTON, *Nucl. Sci. Eng.*, **50**, 127 (1973).