

TABLE III

*Estimations of periplasmic volume from distributions of different solutes in suspensions of Salmonella typhimurium LT2*

Cells (strain SB2349) were grown on Medium 63 containing 0.5% DL-lactate and 20  $\mu$ g of L-tryptophan/ml. They were harvested, washed in Medium 63, and suspended as described under "Growth and Collection of Cells." Suspensions of these cells in Medium 63 containing [ $^3$ H]water and inulin-[ $^{14}$ C]carboxyl, [ $^{14}$ C]sucrose, [ $^{14}$ C]mannitol, [ $^{14}$ C]TMG, or [ $^{14}$ C]N-acetylglucosamine were prepared with final sugar concentrations of 1 mM. After 10 min, the distributions of these labeled solutes were determined by the centrifugation and dilution-filtration methods. The centrifugation results are the averages of duplicate determinations; the dilution-filtration results are averages from five determinations. Periplasmic volumes are given as fractions of the total cell volume. Where  $S$  was a neutral solute, the periplasmic volume was computed as the difference between the  $S$  distributions measured by the centrifugation and dilution-filtration methods. The errors presented in the table are: for centrifugation data, the deviation of the experimental values from the mean; for dilution-filtration data, the standard error of each set of five measurements; and for periplasmic volumes, the sum of the errors for the centrifugation and dilution-filtration results for a particular solute ( $S$ ).

Solute ( $S$ )	Ratio of ( $S_{in}$ ) to ( $S_{ex}$ )		Periplasmic fraction of total cell volume
	Centrifugation	Dilution-filtration	
[ $^{14}$ C]Sucrose	0.24 $\pm$ 0.04	0.00 $\pm$ 0.01	0.24 $\pm$ 0.05
[ $^{14}$ C]TMG	0.82 $\pm$ 0.09	0.43 $\pm$ 0.02	0.39 $\pm$ 0.11
[ $^{14}$ C]N-Acetylglucosamine	0.71 $\pm$ 0.08	0.37 $\pm$ 0.02	0.34 $\pm$ 0.10
[ $^{14}$ C]Mannitol	0.85 $\pm$ 0.05	0.62 $\pm$ 0.03	0.23 $\pm$ 0.08