

TABLE VI

Ion distributions and their relationship to periplasmic osmotic strength

Cell suspensions were prepared as described in the legends to Tables II, III, and IV (strain SL3555) for Experiments 1, 2, and 3, respectively. [^{22}Na]NaCl or [^{36}Cl]NaCl, and [^3H]water or inulin- ^3H methoxy were added to these suspensions in the same way that [^{14}C]sucrose was added (see corresponding tables). Final NaCl concentrations were: 10 mM in Experiment 1, and 1 mM in Experiments 2 and 3. $|j_{\text{peri}}|/|j_{\text{ex}}|$ was determined by the ratio $(V_j - V_{\text{inulin}})/(V_{\text{sucrose}} - V_{\text{inulin}})$.¹¹ The values used for $V_{\text{sucrose}} - V_{\text{inulin}}$ ($= V_{\text{peri}}$) are shown in the appropriate tables. E_{om} was computed from $|j_{\text{peri}}|/|j_{\text{ex}}|$ by using Equation 12. $\Sigma|j_{\text{peri}}|$ was obtained as described in the text from the composition of Medium 63 (K^+ , 87.5 mM; NH_4^+ , 30.3 mM; Mg^{2+} , 0.8 mM; H_2PO_4^- , 12.5 mM; HPO_4^{2-} , 37.5 mM; SO_4^{2-} , 15.9 mM; and pH, 7.4). For example, the periplasmic composition as estimated from an E_{om} of 27 mV (the value estimated from Cl^- distribution data in Experiment 1) was: K^+ , 250 mM; NH_4^+ , 86.6 mM; Na^+ , 28.6 mM; Mg^{2+} , 6.5 mM; H_2PO_4^- , 4.4 mM; Cl^- , 3.5 mM; HPO_4^{2-} , 4.6 mM; SO_4^{2-} , 1.9 mM; and pH, 6.9. The periplasmic osmotic strengths are the osmotic strengths of K_2HPO_4 solutions containing molar ion concentration equal to $\Sigma|j_{\text{peri}}|$ (9).

Experiment	j	$ j_{\text{peri}} / j_{\text{ex}} $	E_{om}	$\Sigma j_{\text{peri}} $	Periplasmic osmotic strength
			mV	mM	mosM
1	Na^+	1.97	17	282	209
	Cl^-	0.35	27	386	285
2	Na^+	3.38	31	419	309
	Cl^-	0.42	23	304	231
3	Na^+	3.11	29	387	286
	Cl^-	0.32	30	389	287