Table 2. *Energetics of buoyancy generation by accumulation of solutes yielding low-density solutions in the vacuole and by active water transport in the vacuole*

	Cell property	Value
1	Dimensions of cylindrical cell	Radius 4×10^{-4} m, length 8×10^{-4} m, area 1.4×10^{-5} m^2, volume 4.02×10^{-10} m^3
2	Specific growth rate of cell	0.5 m^3 cell volume d^{-1} instantaneous increase in cell volume
3	Seawater osmolarity	1013 osmol m^{-3}
4	Vacuolar osmolarity for buoyancy generated by trimethylammonium chloride	1013 osmol m^{-3}, of which 128 osmol m^{-3} is contributed by trimethylammonium chloride
5	Vacuolar osmolarity for buoyancy generated by active water transport	885 osmol m^{-3}
6	Energy (for active transport of solutes and biochemistry) required for trimethylammonium chloride production	4.10×10^{-7} W $cell^{-1}$
7	Energy required for active water transport	7.15×10^{-10} W $cell^{-1}$ for net active water transport; 4.84×10^{-8} W $cell^{-1}$ for gross active water transport, compensating for water leakage down the water potential gradient
8	Density of seawater	1024.6 kg m^{-3}
9	Density of vacuole with buoyancy generated by trimethylammonium chloride	1017.9 kg.m^{-3}
10	Density of vacuole with buoyancy generated by active water transport	1017.6 kg.m^{-3}

Cell dimensions are from Boyd and Gradmann (2002); see Appendix 1 for details of calculations.

Boyd CM, Gradmann D. 2002. Impact of osmolytes on buoyancy of marine phytoplankton. *Marine Biology* **141,** 605–618.