

Synthetic River Media

Recipe

To 10L of distilled H₂O, add the following compounds:

NaHCO ₃	0.7308
CaCO ₃	0.8000
MgSO ₄	0.2566
FeCl ₂	0.0102
KNO ₃	0.0033
CaCl ₂	0.1584
KOH	0.0181
MgCl ₂	0.2902

This recipe was calculated by attempting to take the following considerations into effect after balancing the ions based on what was available. Aluminum was left out due to it having no effect on *Shewanella* and therefore not necessary for these trials. Bicarbonate was not added to its fullest, because the addition of CaCO₃ would form an equilibrium involving additional calcium and bicarbonate, therefore allowing salt and buffering conditions similar to the river to be simulated. pH was raised to within the range given for pH values of the river, but could not be increased further without adding more cations than the information dictates.

Considerations, taken from data provided by the Government of Alberta Oil Sands Information Portal:

pH: 8.0 – 8.2

Alkalinity: 0.08 g/L or more

Conductivity: 250 uS/cm or more

Hardness (CaCO₃): 0.08 g/L or more

Cations:

Ca: 0.0215 g/L or greater

Mg: 0.006 g/L or greater

K: 0.0012 g/L

Fe: 0.0003 g/L or less

Al: 0.004 g/L or less

Na: 0.02 g/L or less

Anions:

HCO₃: 0.1 g/L or greater

SO₄: 0.01 g/L or greater

Nitrate: 0.0002 g/L

Cl: 0.0215 g/L or less

S: 0.003 g/L or less