Cyanobacteria Trace Metal Mixture (CTMM)

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Abstract

Preparation of the trace metal mixture for addition to seawater for the cultivation of marine cyanobacteria, *Prochlorococcus* and *Synechococcus*

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Guidelines

All chemicals used for cultivating cyanobacteria should be of the highest quality.
All re-useable glassware and plastic should be acid-washed and autoclaved.
Use only plastic or teflon spatulas or dust-free weigh paper for weighing out chemicals.

Before start

Prepare the six trace metal stock solutions as described in the Primary Trace Metal Stocks protocol:

- 0.08M $ZnSO_4 \cdot 7H_2O$ ((2.30 g/100 mL)
- 0.05M $CoCl_2 \cdot 6H_2O$ (1.19 g/100 mL)
- 0.90M $MnCl_2 \cdot 4H_2O$ (17.81 g/100 mL)
- 0.03M $Na_2MoO4 \cdot 2H_2O$ (0.726 g/100m mL)
- 0.10M Na_2SeO_3 (1.73 g/100 mL)
- 0.10M $NiCl_2 \cdot 6H_2O$ (2.38 g/100 mL)

Materials

Ethylenediaminetetraacetic acid disodium salt dihydrate E4884 by Sigma Aldrich

Protocol

Step 1.

Weigh out 0.435 g $Na_2EDTA \cdot 2H_2O$ using dust-free weigh paper

REAGENTS
Ethylenediaminetetraacetic acid disodium salt dihydrate E4884 by Sigma Aldrich

Step 2.

Transfer into 100 mL volumetric flask filled with 60 mL Milli-Q water

Step 3.
Dissolve Na_2EDTA by inserting the stopper and inverting flask several times

NOTES
Bonnie Poulos 11 Aug 2015
May have to heat 5 min at 80°C to dissolve.

Step 4.
Weigh out 0.32 g $FeCl_3 \cdot 6H_2O$ using dust-free weigh paper

Step 5.
Dissolve $FeCl_3$ into same volumetric flask and mix by inverting several times

Step 6.
Individually add and dissolve 100 µl of each of the six primary trace metal stocks described in the Primary Trace Metal Stocks protocol. The six primary trace metals to add are $ZnSO_4$, $CoCl_2$, $MnCl_2$, Na_2MoO_4, Na_2SeO_3 and $NiCl_2$.

LINK:
https://www.protocols.io/view/Primary-trace-metal-stocks-c8hzt5

Step 7.
Adjust volume to 100mL mark with Milli-Q water

Step 8.
Using a polycarbonate syringe, filter through 0.2µm syringe filter into a sterile, acid-washed teflon or polycarbonate container in a laminar flow hood

Step 9.
Store sterile CTMM (cyanobacteria trace metal mixture) at 4°C