United States Department of Agriculture- Agricultural Research Service- Greenhouse Production Research Group

Modified Hoagland's Standard Nutrient Recipe

Stock Solution Recipes	
Compound	**Concentration of stock solution**
KH_2PO_4	1 *M* = 136.09 g/L
KNO_3	1 *M* = 101.11 g/L
$Ca(NO_3)_2$	1 *M* = 236.15 g/L
$MgSO_4$	1 *M* = 246.48 g/L
Fe-DTPA	0.071 *M* = 33.24 g/L
$MnCl_2$	0.01 *M* = 1.98 g/L
$CuCl_2$	0.01 *M* =1.7 g/L
$ZnCl_2$	0.01 *M* = 1.3 g/L
H_3BO_3	0.1 *M* = 6.18 g/L
$MoNa_2O_4$	0.001 *M* = 0.242 g/L

Final nutrient solution should be adjusted to pH between 5.6 and 6.0

	Volume of stock per liter of final solution	Element	Final concentration of element
	mL		
Macronutrients			***mM***
KH_2PO_4	2.0	P	2.0
		K	4.5*
KNO_3	2.5	N	7.5**
$Ca(NO_3)_2$	2.5	Ca	2.5
$MgSO_4$	1.0	Mg	1.0
		S	1.0
Micronutrients			**µ*M***
Fe-DTPA	1.0	Fe	71.0
$MnCl_2$	0.9	Mn	9.0
$CuCl_2$	0.15	Cu	1.5
$ZnCl_2$	0.15	Zn	1.5
H_3BO_3	0.45	B	45.0
$MoNa_2O_4$	0.1	Mo	0.1

*K concentration calculated from KH_2PO_4 and KNO_3

**N concentration calculated from KNO_3 and $Ca(NO_3)_2$