

# Linsmaier and Skoog Medium

With Calcium chloride, Vitamins and Sucrose  
Without Agar

**Product Code: PT095**

## Product Description :

Linsmaier and Skoog Medium (LS) has been developed by Linsmaier and Skoog in 1965 for optimizing the organic requirement of tobacco cultures. The medium contains standard Murashige and Skoog (MS) basal salts supplemented with Linsmaier and Skoog vitamins. It is widely used for micro propagation, organ culture, callus culture and suspension culture.

The formulation is a nutrient blend of inorganic salts, vitamins and carbohydrate. Potassium nitrate and ammonium nitrate provides nitrogen and help to maintain pH of the medium. Potassium dihydrogen phosphate serves as a source of phosphate. Microelements like Boron, Manganese, Molybdenum, Copper, Iron and Zinc play a vital role in the plant metabolism. Boron plays a key role in carbohydrate metabolism. Increased concentration of thiamine hydrochloride to 0.4 mg/l from 0.1 mg/l compensates for absence of other vitamins except inositol, which acts as enzymatic cofactor in the universal pathways including glycolysis and TCA cycle along with the primary and secondary metabolism in plants.

The product is plant tissue culture tested but it is the sole responsibility of the user to ensure the suitability of the medium for individual species.

## Composition :

Ingredients	mg/L
<b>MACROELEMENTS</b>	
Ammonium nitrate	1650.000
Calcium chloride	332.200
Magnesium sulphate	180.690
Potassium nitrate	1900.000
Potassium phosphate monobasic	170.000
<b>MICROELEMENTS</b>	
Boric acid	6.200
Cobalt chloride hexahydrate	0.025
Copper sulphate pentahydrate	0.025
EDTA disodium salt dihydrate	37.300

Ferrous sulphate heptahydrate	27.800
Manganese sulphate monohydrate	16.900
Molybdic acid (sodium salt)	0.213
Potassium Iodide	0.830
Zinc sulphate heptahydrate	8.600
<b>VITAMINS</b>	
myo-Inositol	100.000
Thiamine hydrochloride	0.400
<b>CARBOHYDRATE</b>	
Sucrose	30000.000
<b>Total(gms/litre)</b>	<b>34.4</b>

## Material required but not provided :

- Autoclaved distilled water
- Gelling agents like Agar (PCT0901) or CleriGel™ (PCT0903)
- Plant growth regulators
- 1N NaOH/HCl

## Precautions :

- Ensure appropriate pH of the medium before addition of gelling agent as acidic pH will lead to decreased gelation resulting in semi solid flowing gel while alkaline pH will lead to formation of hardened gel.
- Use of Distilled water/Tissue culture grade water is recommended for media preparation as tap water or lower grade water may lead to salt precipitation and improper gelation.
- Avoid preparation of concentrated solutions, as it will lead to precipitation of salts.

## Directions :

- Reconstitute medium by adding required quantity of powder in two-third of total volume with constant, gentle stirring till the medium gets completely dissolved.
- Add heat stable supplements prior to autoclaving.
- Make up the final volume with distilled water.
- Adjust the pH of the medium to  $5.75 \pm 0.5$  using 1N NaOH/HCl.
- Add gelling agent and heat the medium to boiling till complete dissolution of gelling agent.

- Sterilize the medium by autoclaving at 15 lbs and 121°C for 15 min.
- Cool the autoclaved medium to about 45°C before adding heat labile supplements.
- Aseptically dispense the desired amount of medium under a laminar airflow unit in sterile culture vessels.

## **Quality Control:**

### **Appearance**

White to off-white, homogenous, free flowing powder

### **Solubility**

34.4 gms/litre soluble in distilled water

### **Colour and Clarity**

Colourless to light yellow, clear solution

### **pH at 25°C**

3.40 - 4.40

### **Plant Tissue Culture Test**

The growth promoting properties of medium is assessed by providing plant cultures with relative humidity of about 60%±2%, temperature 22°C±2°C and photoperiod of about 16:8. The plant species showed actively growing callus and shoots with no structural, necrotic and toxic deformity.

## **Storage and Shelf Life:**

- The plant tissue culture medium powder is extremely hygroscopic and must be stored at 2-8°C in air tight containers.
- Preferably, entire content of each package should be used immediately after opening.
- Use before the expiry date.

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### **Disclaimer :**

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