

Linsmaier and Skoog Macroelements

Product Code: TS1064

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 is a 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.

Linsmaier and Skoog Macroelements is a nutrient blend of inorganic salts which provides all the essential macroelements to the plants. Potassium dihydrogen phosphate serves as a source of phosphate. Potassium nitrate and ammonium nitrate stimulate morphogenesis and embryogenesis. Magnesium and sulphur act as precursors in many vital metabolic processes and is supplied to the plants in the form of magnesium sulphate. Magnesium also helps to maintain cation anion balance. Calcium serves as an important modulator in enzymatic reactions and is required for cell wall synthesis and stabilization.

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
MACROELEMENTS	
Ammonium nitrate	1650.000
Calcium chloride	332.200
Magnesium sulphate	180.690
Potassium nitrate	1900.000
Potassium phosphate monobasic	170.000
Total(gms/litre)	4.2

Material required but not provided :

- Autoclaved distilled water
- Plant growth regulators

- 1N NaOH/HCl
- Sucrose (PCT0607)
- Linsmaier and Skoog Vitamins (VP017)
- Linsmaier and Skoog Microelements (TS1063/PL010)
- Gelling agents like Agar (PCT0901) or CleriGel™ (PCT0903)

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 powder by adding required quantity of powder in two-third of total volume with constant, gentle stirring till the powder 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 ± 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

4.2 gms/litre soluble in distilled water

Colour and Clarity

Colourless to light yellow, clear solution

pH at 25°C

4.40 - 5.40

Plant Tissue Culture Test

The growth promoting property of macroelements is assessed by adding required supplements to make a complete medium and testing for culture performance. Culture test is done by providing plant cultures with relative humidity of about $60\% \pm 2\%$, temperature $22^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 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 macroelements powder is extremely hygroscopic and must be stored at $2-8^{\circ}\text{C}$ 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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