Info Sheet FOOD

Minerals for BioProcess and BioTechnology

For the manufacturing process of cultivated meat, stem cells from an animal are grown in bioreactors at high densities and volumes. This process is highly challenging and specialized. Bioreactor based cell culturing requires tight control of all factors that may influence the yield, the quality of the target product. Cells are fed with an oxygen-rich cell culture medium made up of basic nutrients such as amino acids, glucose, vitamins, and inorganic salts, and supplemented with proteins and other growth factors. A stable pH-value of the culture media is a crucial requirement influencing the ability how the cells can uptake nutrients and proliferate.

For the perfect fit Dr. Paul Lohmann® offers a wide range of nutritious Trace Elements and high performance Salts to buffer the media, providing an environment that maintains the structural and physiological integrity of cells in vitro.

Products

Product	Metal content	pH (5 %)	Function
Ammonium			
Ammonium Formate	approx. 28.5 % NH_4	approx. 6-7	♦ buffering agent
Ammonium Formate Solution	approx. 14 % NH_4	approx. 6-7	♦ buffering agent
Calcium			
Calcium Acetate	approx. 24 % Ca	approx. 7.2-8.2	♦ buffering agent
Calcium Acetate Solution	approx. 6 % Ca	approx. 5.5-8.5	♦ buffering agent
Calcium Chloride 2-hydrate	approx. 27 % Ca	approx. 7	♦ osmotic balance support ♦ membrane potential regulation
Calcium Formate	approx. 30.5 % Ca	approx. 6.5-9.0 (10%)	♦ buffering agent
Copper			
Copper(II) Sulfate, anhydrous	approx. 40 % Cu	approx. 3.5-4.5	♦ nutrient
Copper(II) Sulfate 1-hydrate	approx. 35 % Cu	approx. 3.5-4.5 (4%)	♦ nutrient
Copper(II) Sulfate 5-hydrate	approx. 25.5 % Cu	approx. 4	♦ enzymatic co-factor ♦ cell growth support ♦ nutrient
Edta			
Disodium EDTA 2-hydrate*	approx. 12 % Na	approx. 4.0-5.0	♦ chelator
Iron			
Ferric Ammonium Citrate, brown	approx. 16.5-28 % Fe	approx. 5-8	♦ iron transporter (chelator) ♦ enzymatic co-factor ♦ nutrient
Ferric Ammonium Citrate Solution	approx. 8-15.5 %	approx. 5.5-6.0	♦ nutrient
Ferric Choline Citrate*	min. 10.9 % Fe	approx. 3	♦ iron transporter (chelator) ♦ enzymatic co-factor
Ferric Citrate	min. 18 % Fe	approx. 2	♦ iron transporter (chelator) ♦ enzymatic co-factor
Ferric Pyrophosphate, soluble	min. 10.5 % Fe	approx. 6	♦ enzymatic co-factor
Ferrous Sulfate, dried	approx. 32 % Fe	approx. 3-4	♦ nutrient
Ferrous Sulfate 7-hydrate	approx. 20 % Fe	approx. 3.5	♦ enzymatic co-factor ♦ nutrient

Dr. Paul Lohmann®

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Product	Metal content	pH (5 %)	Function
Magnesium Magnesium Sulfate, dried	approx. 15 % Mg	approx. 7	♦ cellular and enzymatic regulation
Magnesium Sulfate 7-hydrate	approx. 10 % Mg	approx. 6.5	♦ cellular and enzymatic regulation ♦ nutrient
Manganese Manganese(II) Sulfate 1-hydrate	approx. 32 % Mn	approx. 5	♦ enzymatic co-factor ♦ nutrient
Potassium Potassium Chloride	min. 52 % K	approx. 5	♦ osmotic balance support
Dipotassium Hydrogen Phosphate 3-hydrate*	approx. 34 % K; approx. 14 % P	approx. 9.2	♦ buffering agent
Sodium Sodium Acetate, anhydrous	approx. 28 % Na	approx. 7.5-9.2	♦ buffering agent
Sodium Acetate 3-hydrate	approx. 17 % Na	approx. 7.5-9.2	♦ buffering agent
Sodium Acetate Solution	approx. 5 % Na	approx. 9.0 (1%)	♦ buffering agent
Sodium Carbonate, anhydrous	approx. 43 % Na	approx. 11	♦ cell culture buffer ♦ buffering agent
Sodium β-glycerophosphate 5-hydrate*	approx. 15 % Na; α-salt content < 1 %	approx. 9	♦ osmotic balance support ♦ cell culture buffer
Sodium Formate	approx. 34 % Na	approx. 6.5-9.5 (10%)	♦ buffering agent
Monosodium Phosphate, anhydrous*	approx. 19 % Na; approx. 25.5 % P	approx. 4	♦ osmotic balance support ♦ cell culture buffer ♦ buffer for purification
Monosodium Phosphate 1-hydrate*	approx. 17 % Na; approx. 22 % P	approx. 4	♦ osmotic balance support ♦ cell culture buffer
Disodium Hydrogen Phosphate, anhydrous*	approx. 32 % Na; approx. 22 % P	approx. 9	♦ osmotic balance support ♦ cell culture buffer
Disodium Hydrogen Phosphate 7-hydrate*	approx. 17 % Na; approx. 12 % P	approx. 9	♦ buffering agent
Sodium Propionate	approx. 24 % Na	approx. 7.5-10.5	♦ buffering agent
Sodium Propionate Solution	approx. 10 % Na	approx. 9.0 (as is)	♦ buffering agent
Sodium Succinate 6-hydrate	approx. 17 % Na	approx. 8	♦ cell culture buffer
Zinc Zinc Sulfate 1-hydrate	approx. 36.5 % Zn	approx. 4.0-5.6	♦ nutrient
Zinc Sulfate 7-hydrate	approx. 22.5% Zn	approx. 5	♦ enzymatic co-factor ♦ cell growth support ♦ nutrient
Amino acid salts L-Aspartic acid Sodium Salt*		approx. 6	♦ analysis of diffusion and osmotic coefficients of amino acids
L-Tyrosine Disodium Salt 2-hydrate*		approx. 11	♦ essential cell nutrition

*No use for regular food

All here recommended products are soluble and available in different physical appearances.
Please contact us for more details.

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Certification

Our company is GMP (according part II – active pharmaceutical substances), FSSC 22000/ISO 22000 and DIN EN ISO 9001 certified, and our products are: Made in Germany.
In March 2012 our production site in Emmerthal was successfully inspected by the FDA (U.S. Food and Drug Administration) in the context of FSMA (food safety modernization act).