

Chloride in Infant Formula

Orion 4-Star pH/ISE
Benchtop Meter

Food & Beverage

Measurement by Ion Selective Electrode (ISE) is one of the most common analytical techniques used in chemistry laboratories today. Thermo Electron Corporation offers a wide range of meters, electrodes and consumables to accurately measure ISE levels in a variety of samples.

One common parameter measured using ISE methods is chloride, which is found in most infant formulas.



For instructions on ISE measurement using Orion products, download our Star Series meter information at www.thermo.com/water.



Orion 4-Star pH/ISE for ISE measurement


Chloride is an essential mineral to help babies grow healthy and strong. The chloride content of cow's milk and soy formula has stimulated interest in the past 15 years because of serious health conditions induced by several infant formulas with deficient chloride concentrations. Studies have shown that inadvertent feeding of chloride deficient infant formula has resulted in failure-to-thrive, anorexia, weakness and some findings of slow development.

Many manufacturers use Thermo products everyday for purposes of research & development, quality control and product

labeling. Our meters, electrodes and solutions help to ensure the accuracy of ingredient content.

With the easy-to-use Orion 4-Star pH/ISE meter (Cat. No. 1115000) and Orion ionplus® Chloride electrode (Cat. No. 9617BNWP) pH and ISE measurements are fast and accurate. This rugged meter offers a full complement of GLP-related features and can store up to 10 methods; a valuable feature for busy multi-user labs. Orion products offer top quality meter features with proven electrode technology to provide a complete package needed to measure chloride in infant formula.

Orion 4-Star pH/ISE

The  with the Orion ionplus® Chloride electrode (Cat. No. 9617BNWP) offers an optimum solution to meet pH and ISE measurement needs.

Orion 4-Star pH/ISE Specifications:

Specifications		Benefit
pH		
Readout Range / Resolution	-2.000 to 19.999 or 0 to 14 in aqueous solutions / 0.1,0.01,0.001	Calibration point flexibility
Relative Accuracy	± 0.002	For exceptional accuracy
SMART STABILITY™ and SMART AVERAGING™	Resolution dependent / automatic	Optimized accuracy, precision & response time
AUTO-CAL™ and/or Manual Calibration	1 to 5 points; US/NIST, DIN, and custom buffers recognized	Protocol compliance
ISE		
Range / Resolution	0 to 19900 / 1,2, or 3 significant digits	Wide operating range/Increased accuracy
Relative Accuracy	± 0.2 mV or 0.05%, whichever is greater	
SMART STABILITY™ and SMART AVERAGING™	Resolution dependent / automatic	Optimized accuracy, precision, & response time
Units	M, mg/L, %, ppb, or no units	Choice of reporting units
# ISE Cal points	1 to 5	
Special ISE Calibration Features	Linear point to point, selectable auto-blank non-linear, low concentration range	
Temperature		
Range / Resolution	-5 to 105 °C / 0.1 up to 99.9 °C, 1.0 over 99.9 °C	Allows for temperature variations
Relative Accuracy	± 0.1 °C	
Temperature Compensation	Auto/Manual	
Display	Custom backlit LCD, for easy viewing	Easy to read
Special GLP Software Features		
# Of Data Logging Points	200 points by time, stability or manual read with time/date stamp	Expanded data storage available
Calibration Log	Last 10 Calibrations	Establish audit trail
User Method Storage	10 Saved	For easy retrieval of routine tests
Power	Universal power adapter and battery power 4 x AA batteries	Data is secure
Regulatory and Safety	CE, CSA, UL, TÜV, FCC Class A limits	Meets all necessary regulations
Environmental Operating Conditions		
Ambient Operating Temperature	5 to 45 °C	
Relative Humidity	5 to 85% Non-Condensing	
IP Rating	IP54, splashproof and dustproof	
Warranty	36 months (from date of purchase)	Reduces service cost

Above data generated under optimal/controlled circumstances.

Equipment needed for pH/ISE measurement using the Orion 4-Star pH/ISE meter:

Description	Orion Cat. No.
ISE Application Package (includes all items listed below)	1010147
Star Series Method Note: Chloride in Infant Formula	M-1416-E
4-Star benchtop pH/ISE meter	1115000
Orion ionplus® Chloride electrode	9617BNWP
Chloride standard, 1000 ppm, 475 mL	941708
Chloride standard, 100 ppm, 475 mL	941707
Optimum Results B Reference Fill Solution 5x60 mL	900062
Ionic Strength Adjuster, 475 mL	940011
Electrode Stand	1110001
Benchtop Stirrer	096019
Also Available as an Accessory: ATC stainless steel body probe	927007MD

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T-1416-E 02/05 RevB

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