

Nitrates in Processed Meats

Orion 4-Star pH/ISE
Benchtop Meter

Food & Beverage

Nitrates are used as a preservative to help prevent the growth of bacteria. Both nitrate and nitrite ions provide the same end result, but nitrite is preferred since the pathway for stabilization of color is more direct.

Thermo Electron Corporation offers a new line of meters and ISE electrodes for test methods to support the increasing regulations mandated by the U.S. Department of Agriculture.



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



Nitrates in Meat

Salt is used as a preservative in meat since it prevents the growth of some types of bacteria that are responsible for meat spoilage. Years ago, it was thought that certain salts should be used because they produced the pink color and special flavor in cured meat. However, it has been determined that when nitrate changes to nitrite, by bacterial action during processing and storage, it is the nitrite that influences the color and flavor. Sodium nitrite is used today commercially in curing meat. The amount of sodium nitrite that can legally be used during the curing process has been determined by the U.S. Department of Agriculture and is listed by product in the Meat Inspection Regulations. The use

of nitrites, nitrates or combinations of them cannot result in more than 200 parts per million (ppm), calculated as sodium nitrite in the finished product. The Orion 4-Star pH/ ISE benchtop meter (Cat. No. 1115000) and the Orion ionplus® Nitrates electrode (Cat. No. 9707BNWP) can quickly and accurately determine the level of nitrate in any sample. This meter offers a full complement of GLP-related features, can store up to 10 methods and up to 200 datalog points with a time and date stamp. The Orion products offer top quality meters and electrodes backed by advanced proven technology to provide a complete package needed to measure type of sample.

Orion 4-Star pH/ISE

Thermo Electron's advanced technology offers you superior quality with the Orion 4-Star pH/ ISE meter (Cat. No. 1115000) and simpler, faster measurements with the Orion ionplus® nitrate electrode (Cat. No. 9707BNWP) than with any other analytical techniques.

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.
Nitrate Application Package (includes all items listed below)	1010131
Star Series Method Note: Nitrate in Meat	M-1400-E
4-Star pH/ ISE benchtop meter	1115000
Orion ionplus® Nitrate Module	9707BNWP
Nitrate Standard as N, 100ppm	930707
Optimum Results F, Reference Fill Solution, 5x60 mL	900046
Nitrate ISA	930711
Nitrate Interference Suppressant Solution	930710
Benchtop electrode stand	1110001
Benchtop Stirrer	096019

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