ION INDICATORS

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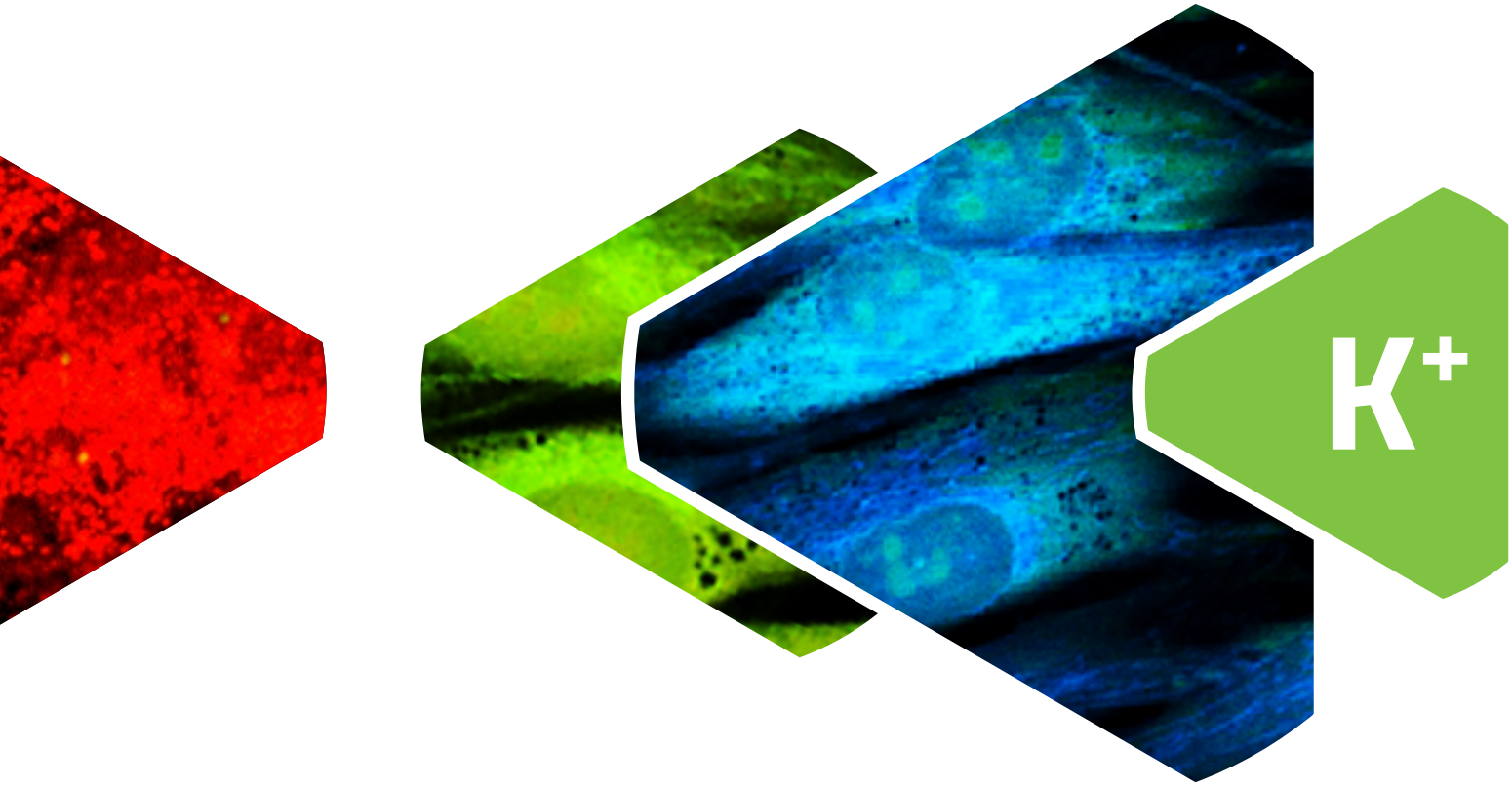

ION Potassium Green-4 AM

3021C | 3021F

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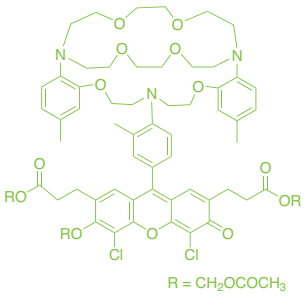
Product Specifications



$C_{56}H_{60}Cl_2N_3O_{13}$

Molecular Weight	1071 g/mol
Solubility	DMSO
K_d	20 mM
Odor	None
Fire and Explosion Hazards	None
Shelf Life	Valid for one year after delivery, if stored properly

TLC

Solvent	8% Methanol/ Chloroform
R_f	0.5

HPLC

Column	C_{18}
Detector Settings	254 nm and 460 nm
Purity	> 80%

Absorbance Spectrum

Solvent	Methanol
Absorbance max	469 ± 3 nm
ε	20,000 $M^{-1}cm^{-1}$

Fluorescence Spectrum

Solvent	Methanol
Emission max	546 nm ± 3 nm
Excitation max	526 nm ± 3 nm

^1H NMR

All relevant peaks present	
Solvent	Deuterated chloroform

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Theory

IPG-4 was developed to overcome the deficiency of existing Potassium indicators- PBFI, APG-1, and APG-2 in their selectivities over sodium. Whereas the existing indicators have selectivities hovering around 2:1 over sodium, IPG-4 has an almost total selectivity of 100:1. As a trade-off, the increase in selectivity leads to hydrophobicity. The Cryptand has more carbons that increase the hydrophobicity. The selectivity has however provided scientists with a tool for specific experiments as shown in the list of specific publications below.

- J. Humphries, L. Xiong, J. Liu, A. Prindle, F. Yuan, H. A. Arjes, L. Tsimring, G. M. Süel, Species-independent attraction to biofilms through electrical signaling. Cell 168, 200–209.e12 (2017)
- Prindle, A. et al. Ion channels enable electrical communication in bacterial community. Nature527, 59–65 (2015).
- M. Szabo, M.I. Wallace, Imaging potassium-flux through individual electropores in droplet interface bilayers, Biochim. Biophys. Acta (2015)
- Kilic K, Karatas H, Dönmez-Demir B et al (2018) Inadequate brain glycogen or sleep increases spreading depression susceptibility. Ann Neurol 83:61–73.
- Hover, S., Foster, B., Fontana, J., Kohl, A., Goldstein, S. A. N., Barr, J. N., and Mankouri, J. (2018) Bunyavirus requirement for endosomal K+ reveals new roles of cellular ion channels during infection. PLoS Pathog 14, e1006845

Safety Data Sheet
ION Potassium Green-4 AM

SECTION 1: Identification of the Substances and the Company/Undertaking

Identification of the Substance or Mixture

Catlog Numbers: 3011C | 3011F
Product Name: ION Potassium Green-4 AM

Company/Undertaking Identification

Ion Indicators
3055 Hunter Road, Box 3
San Marcos, TX 78666
+1 512.957.9123

24 hour Emergency Response

866-536-0631
301-431-8585
+1-301-431-8585 (Outside of the U.S.)

For Research Use Only. Not for use in diagnostic procedures.

Section 2: Hazards Identification

GHS - Classification

Signal word: None
Health hazards: Not classified
Hazard statements: Not applicable

Precautionary Statements

Prevention: Not applicable
Response: Not applicable

Storage: Not applicable
Disposal: Not applicable

Principle Routes of Exposure

Potential Health Effects

Eyes: May cause eye irritation with susceptible persons.
Skin: May cause skin irritation in susceptible persons.
Inhalation: May be harmful by inhalation.
Ingestion: May be harmful if swallowed.

Specific Effects

Carcinogenic effects: No information available.
Mutagenic effects: No information available.
Reproductive toxicity: No information available.
Sensitization: No information available.

Target organ effects: No known effects under normal use conditions.

HMIS

Health	0
Flammability	0
Reactivity	0

Section 3: Composition/Information on Ingredients

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Section 4: First Aid Measures

Skin contact: Rinse cautiously with water for several minutes. Immediate medical attention is not required.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Ingestion: Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice. inhalation Not expected to be an inhalation hazard under anticipated conditions of normal use of this material. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed: Not applicable

Notes to physician: Treat symptomatically.

Section 5: Firefighting Measures

Extinguishing Media

Suitable extinguishing media: Water spray. Carbon dioxide (CO2). Foam. Dry chemical.

Unsuitable extinguishing media: Not Known
Specific hazards arising from the chemical: Not known
Advice for firefighters: Standard procedure for chemical fires.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Ensure adequate ventilation. Always wear recommended Personal Protective Equipment. Use personal protection equipment. See Section 8 for more detail.

Environmental precautions: Avoid discharge into drains and waterways whenever possible.

Methods and material for containment and cleaning up: Take up mechanically, placing in appropriate containers for disposal.

Reference to other sections: See section 8 and 12 for more information.

Section 7: Handling and Storage

Handling: Always wear recommended Personal Protective Equipment. No special handling advices are necessary.

Conditions for safe storage, including any incompatibilities: Keep in a dry, cool and well-ventilated place. Keep in properly labeled containers.

Specific end use(s): For research use only.

Section 8: Exposure Controls/Personal Protection

Control Parameters

Exposure limits: We are not aware of any national exposure limit.
Engineering measures: Ensure adequate ventilation, especially in confined areas.

Exposure Controls

Personal Protective Equipment: Personal Protective Equipment requirements are dependent on the user institution's risk assessment and are specific to the risk assessment for each laboratory where this material may be used.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection: Impervious gloves.

Eye protection: Wear safety glasses with side shields (or goggles).

Skin and body protection: Lightweight protective clothing.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls: Prevent product from entering drains or waterways whenever possible.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties.

Form: Solid

Appearance: No data available

Odor: No data available

Odor threshold: No data available

Boiling point/boiling range: °C No data available; °F No data available

Flash point: °C No data available;°F No data available

Melting point/melting range: °C No data available;°F No data available

Autoignition temperature: °C No data available;°F No data available

Evaporation rate: No data available

Flammability (solid, gas): No data availabl

Oxidizing properties: No data available

Water solubility: No data available

Upper explosion limit: No data available

Lower explosion limit: No data available

Partition coefficient: No data available

n-octanol/water

Vapor pressure: No data available

Vapor density: No data available

Viscosity: No data available

pH value: No data available

Section 10: Stability and Reactivity

Reactivity: None known.

Stability: Stable under normal conditions.

Materials to avoid: No dangerous reaction known under conditions of normal use.

Possibility of hazardous reactions: Hazardous reaction has not been reported

Hazardous decomposition products: None under normal use conditions.

Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: None under normal processing.

Hazardous decomposition products: Carbon monoxide (CO). Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen chloride.

Section 11: Toxicological Information

Acute Toxicity: To the best of our knowledge, the chemical, physical, biological, and toxicological properties of this product have not been thoroughly investigated.

Principle Routes of Exposure

Potential Health Effects

Eyes: May cause eye irritation with susceptible persons.

Skin: May cause skin irritation in susceptible persons.
Inhalation: May be harmful by inhalation.
Ingestion: May be harmful if swallowed.
Carcinogenic effects: No information available.
Mutagenic effects: No information available.
Reproductive toxicity: No information available.
Sensitization: No information available.

Section 12: Ecological Information

Ecotoxicity: The environmental impact of this product has not been fully investigated.

Mobility: No information available.

Biodegradation: No information available.

Bioaccumulation: No information available.

Section 13: Disposal Considerations

Waste treatment methods: The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in according to approved disposal technique.

Disposal of this product, its solutions or of any by-products, shall comply with the requirements of all applicable local, regional or national/federal regulations

Section 14: Transport information

IATA/ADR/DOT-US/IMDG: Not Classified as dangerous in the meaning of transport regulations.

Proper shipping name: No dangerous good in sense of these transport regulations

Hazard class: None

Subsidiary class: None

Packing group: None

UN-No: None

Environmental hazards: None

Section 15: Regulatory Information

US Federal Regulations

SARA 313: This product is not regulated by SARA.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61): This product does not contains HAPs.

US State Regulations

California Proposition 65: This product does not contain any Proposition 65 chemicals.

WHMIS Hazard Class: Non-controlled

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Section 16: Other Information

For Research Use Only. Not for use in diagnostic procedures.

"The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since the Company cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein.

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