

# ION-SELECTIVE OPTICAL FIBER

## A NOVEL AND VERSATILE OPTICAL FIBER SENSOR FOR IONS DETERMINATION: LOW COST AND DISPOSABLE ION-SELECTIVE OPTODES

Keywords: optical fiber sensor, ion selective sensor, chemical sensor, optode, plastic optical fiber

### TECHNOLOGY

INO has developed a new sensor technology based on transmission measurements with a specially designed ion-selective multimode plastic optical fiber. The technology permits determination of free ion concentration in aqueous solutions. Ion-selective fiber (ISF) is a multimode plastic optical fiber with a chemically-sensitive cladding. The measuring system is simple and could be used for parallel measurements with several sensors. This technology includes a unique method of data treatment reducing the need for repetitive sensor calibrations.

### APPLICATIONS

ISF technology is aimed at determination and monitoring of free ion concentrations in aqueous samples on a routine basis in:

- \_ Several industries such as paper, oil and gas, agrifood, ...
- \_ Waste and wastewater treatment
- \_ Clinical labs

### COMPETITIVE ADVANTAGES

Major advantages of the INO's ISF technology are:

- \_ Low cost and easy replacement of the sensing part
- \_ No need for recalibration in most situations
- \_ Immunity and insensitivity to electromagnetic fields
- \_ Possibility to carry measurements in colored, turbid, opaque and inhomogeneous media
- \_ Custom tailored membrane compositions adjusting sensor response and lifetimes

### INTELLECTUAL PROPERTY

*Evanescent wave multimode optical waveguide sensor with continuous redistribution of optical power between the modes*  
US 7,864,321

### STATE OF DEVELOPMENT

The ISF technology has been developed up to the prototype level. It has been validated for determination of free concentrations in aqueous samples for:

- Na<sup>+</sup>
- K<sup>+</sup>
- Ca<sup>2+</sup>
- NO<sub>3</sub><sup>-</sup>
- NH<sub>4</sub><sup>+</sup>

pH optode is currently under development. The technology (sensor configuration and software) is ready for advanced prototyping aimed at final product design. Furthermore, other membranes, based on customers needs, can be developed.

### BUSINESS OPPORTUNITY

INO is looking for a manufacturer or an industrial partner to invest in this technology and help to bring the ion-selective optical fiber to the level of a commercial device.



Standard setup for ion measurement

### CONTACT

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For the complete list of technologies available for transfer  
[www.ino.ca/availabletechnologies](http://www.ino.ca/availabletechnologies)



CHALLENGING LIGHT  
FOR OUR PARTNERS

# TECHNOLOGIES READY FOR PARTNERS

INO (National Optics Institute) is Canada's leading center of expertise in industrial applications for optics/photonics. It is home to the largest concentration of skills in the field and serves clients of all sizes across Canada and around the world.

INO has a variety of technologies and innovative processes in its strong IP portfolio. These assets represent unique business opportunities for companies seeking innovative technologies to bring to the market. These technology transfers are carried out mainly through licensing or intellectual property sales.

For the complete list of technologies available for transfer  
[www.ino.ca/availabletechnologies](http://www.ino.ca/availabletechnologies)

