INFIQC
INSTITUTO DE INVESTIGACIONES EN FISICOQUÍMICA DE CÓRDOBA

ANALYTICAL CHEMISTRY

# QUALITY CONTROL & QUANTIFICATION OF ORGANIC COMPOUNDS BY CHROMATOGRAPHY

High-performance liquid chromatography (HPLC), gas chromatography (GC) and mass spectrometry-based detection enable the separation, identification and quantification of organic compounds in complex matrices, including trace-level analysis. The service supports quality control, product development, environmental monitoring and research.

## WHO THIS SERVICE IS FOR

### PHARMACEUTICALS
Active ingredients, impurities and excipients; quality control.

### FOOD INDUSTRY
Contaminants, additives, antioxidants and bioactive compounds.

### CHEMICAL & PETROCHEMICAL
Chemical characterization and quality control.

### R&D LABS & STARTUPS
Development and validation of analytical methods.

### FRAGRANCES, COSMETICS & PERSONAL CARE
Identification of components in complex mixtures.

### AGRIBUSINESS & ENVIRONMENT
Pesticides, herbicides and contaminants in water, soil and crops.

### FORENSIC LABORATORIES
Drug screening and forensic analytical studies.

## METHODOLOGY & TECHNICAL CAPABILITIES

HPLC and GC with multiple detector options; gas chromatography–mass spectrometry (GC-MS) and liquid chromatography–tandem mass spectrometry (LC-MS/MS).

## SERVICES PROVIDED

- Separation, identification and quantification of organic chemicals in complex samples.
- Analytical method validation for pharmaceutical and food applications.
- Client-specific method development, optimization and R&D support.

## EQUIPMENT & SPECIALIST EXPERTISE

HPLC and GC systems with different detectors, MS-coupled chromatography and specialist staff; methods and reports can be adapted to customer requirements.

## KEY ADVANTAGES

A choice of detection techniques provides selectivity and specificity for different analytes, including trace-level measurements.

## REPORT DELIVERY

Approximately 1 week for straightforward analyses; up to 15 days when specific method development is required.

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MATERIALS CHARACTERIZATION

# X-RAY POWDER DIFFRACTION & RIETVELD ANALYSIS OF CRYSTALLINE MATERIALS

We provide X-ray diffraction (XRD) measurements of polycrystalline solids, crystalline phase identification and Rietveld refinement. These techniques support crystal-structure characterization and quantitative phase analysis for research, industrial quality control and product development.

## WHO THIS SERVICE IS FOR

### PHARMACEUTICALS
Identification and quantification of crystalline active ingredients and excipients.

### FOOD INDUSTRY
Assessment of additives, minerals and solid-product composition.

### CHEMICAL & COATINGS INDUSTRIES
Analysis of pigments and other crystalline solids.

### MINING & GEOLOGY
Mineral identification and crystalline phase quantification.

### CONSTRUCTION & ARCHITECTURE
Characterization of asbestos-containing phases and ceramic materials.

### R&D LABS & STARTUPS
New materials, solid formulations and quality assessment.

## METHODOLOGY & TECHNICAL CAPABILITIES

Powder XRD data acquisition, phase identification using dedicated crystallographic databases and Rietveld refinement for crystal-structure analysis and phase quantification.

## SERVICES PROVIDED

- Identify crystalline phases and determine crystal structures in solid samples.
- Quantify crystalline phases and correlate results with chemical composition when appropriate.
- Provide customized analysis, technical reports and support for materials development.

## EQUIPMENT & SPECIALIST EXPERTISE

Powder diffractometers with high-resolution detectors, crystallographic databases, Rietveld analysis software and specialist staff in crystallography and solid-material characterization.

## KEY ADVANTAGES

Generally non-destructive analysis; quantitative phase characterization beyond basic pattern identification.

## REPORT DELIVERY

Up to 1 week for XRD datasets without interpretation; up to 2 weeks for phase analysis, quantification and the final report.

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MOLECULAR CHARACTERIZATION

# QUALITY CONTROL & VALIDATION OF MOLECULES, ACTIVE INGREDIENTS AND STANDARDS

High-resolution solution-state nuclear magnetic resonance (NMR) spectroscopy is used to identify organic compounds and confirm their chemical structures in aqueous or organic solutions. Analyses support quality control, product validation and development, from routine testing to more demanding studies.

## WHO THIS SERVICE IS FOR

### PHARMACEUTICAL COMPANIES
Quality control of active ingredients, including cannabinoids, heparin and sclerosing agents; reference standards.

### FOOD INDUSTRY
Raw materials and additives; validation of secondary standards.

### AGROCHEMICALS & BIOTECHNOLOGY
Characterization of active molecules and formulations.

### R&D INSTITUTES, STARTUPS & TESTING LABS
Chemical structure verification and new product development.

## METHODOLOGY & TECHNICAL CAPABILITIES

Solution-state NMR measurements using high-resolution spectrometers and expert interpretation by organic chemistry and structural analysis personnel.

## SERVICES PROVIDED

- Molecular identification and structural confirmation.
- Purity assessment, impurity identification and quality control of selected active compounds.
- Provision of reference standards, secondary-standard validation and analysis of food raw materials and bioactive compounds.

## EQUIPMENT & SPECIALIST EXPERTISE

High-resolution NMR spectrometers, specialized personnel and protocols and reporting tailored to each request.

## KEY ADVANTAGES

Non-ionizing spectroscopy, generally non-destructive measurements in solution and small sample requirements (on the milligram scale).

## REPORT DELIVERY

Average turnaround: 15 days from receipt of the sample to delivery of the final report.

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CRYOGENIC SUPPLIES

# PRODUCTION & SUPPLY OF HIGH-PURITY LIQUID NITROGEN

INFIQC produces and supplies cryogenic liquid nitrogen with 99.999% purity. The service supports low-temperature cooling, cryopreservation of sensitive biological materials and the operation of specialized scientific equipment, with technical guidance on safe handling.

## WHO THIS SERVICE IS FOR

### FOOD INDUSTRY
Cryogenic freezing, cooling and preservation.

### VETERINARY CENTERS & GERMPLASM BANKS
Preservation of biological material.

### UNIVERSITIES & R&D CENTERS
Experiments and processes requiring extremely low temperatures.

### BIOLOGY & BIOTECHNOLOGY LABS
Storage of cells, tissues and genetic material.

### PHARMACEUTICALS & HOSPITALS
Cooling of sensitive equipment, including superconducting NMR magnets.

## METHODOLOGY & TECHNICAL CAPABILITIES

In-house production of 99.999%-purity cryogenic liquid nitrogen, with infrastructure for safe cryogenic storage and transport and trained technical personnel.

## SERVICES PROVIDED

- Supply of liquid nitrogen to laboratories, industrial users and research facilities.
- Advice on safe handling, cooling and preservation applications.
- Delivery coordination based on required volume, transport and storage conditions; assistance with specialized equipment.

## EQUIPMENT & SPECIALIST EXPERTISE

Dedicated cryogenic production and handling infrastructure; traceability controls and personnel trained in cryogenic safety procedures.

## KEY ADVANTAGES

High-purity supply and arrangements tailored to the customer's intended use and logistics.

## ORDERING & DELIVERY

Orders are received on Mondays and Tuesdays; deliveries are scheduled from Wednesday onward.

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TECHNICAL WORKSHOP

# SCIENTIFIC GLASSBLOWING: REPAIR, MODIFICATION & FABRICATION

Our scientific glassblowing workshop designs, repairs, modifies and fabricates laboratory and industrial apparatus made from borosilicate 3.3 glass and quartz. The service uses glassblowing and high-temperature forming methods, including custom work based on client drawings or specifications.

## WHO THIS SERVICE IS FOR

### CHEMISTRY & BIOTECHNOLOGY LABS
Repairs and custom glass components for experiments and testing.

### UNIVERSITIES & RESEARCH CENTERS
Specialized scientific glassware for R&D projects.

### MATERIALS & QUALITY CONTROL LABS
Custom components and specialist technical advice.

### PHARMACEUTICAL & CHEMICAL INDUSTRIES
Apparatus for synthesis, reactions and quality control.

### OIL, MINING & INDUSTRIAL FACILITIES
Borosilicate apparatus for experiments and process monitoring.

## METHODOLOGY & TECHNICAL CAPABILITIES

High-temperature stretching, bending, blowing and shaping of borosilicate 3.3 glass and quartz, including fabrication to drawings and technical requirements.

## SERVICES PROVIDED

- Repair damaged glass equipment and modify existing components.
- Design and fabricate tailored apparatus; advise on glass selection, use and maintenance.
- Inspect equipment, trace completed work and coordinate collection, return and project follow-up.

## EQUIPMENT & SPECIALIST EXPERTISE

Dedicated workshop with torches, high-temperature furnace, cutting and measuring tools, operated by experienced scientific glassblowing personnel.

## KEY ADVANTAGES

Custom work, chemical and thermal stability of borosilicate glass, and support for preventive and corrective maintenance.

## SERVICE TIME

Many repairs can be completed immediately or within days; complex work depends on design, complexity and material availability.

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