

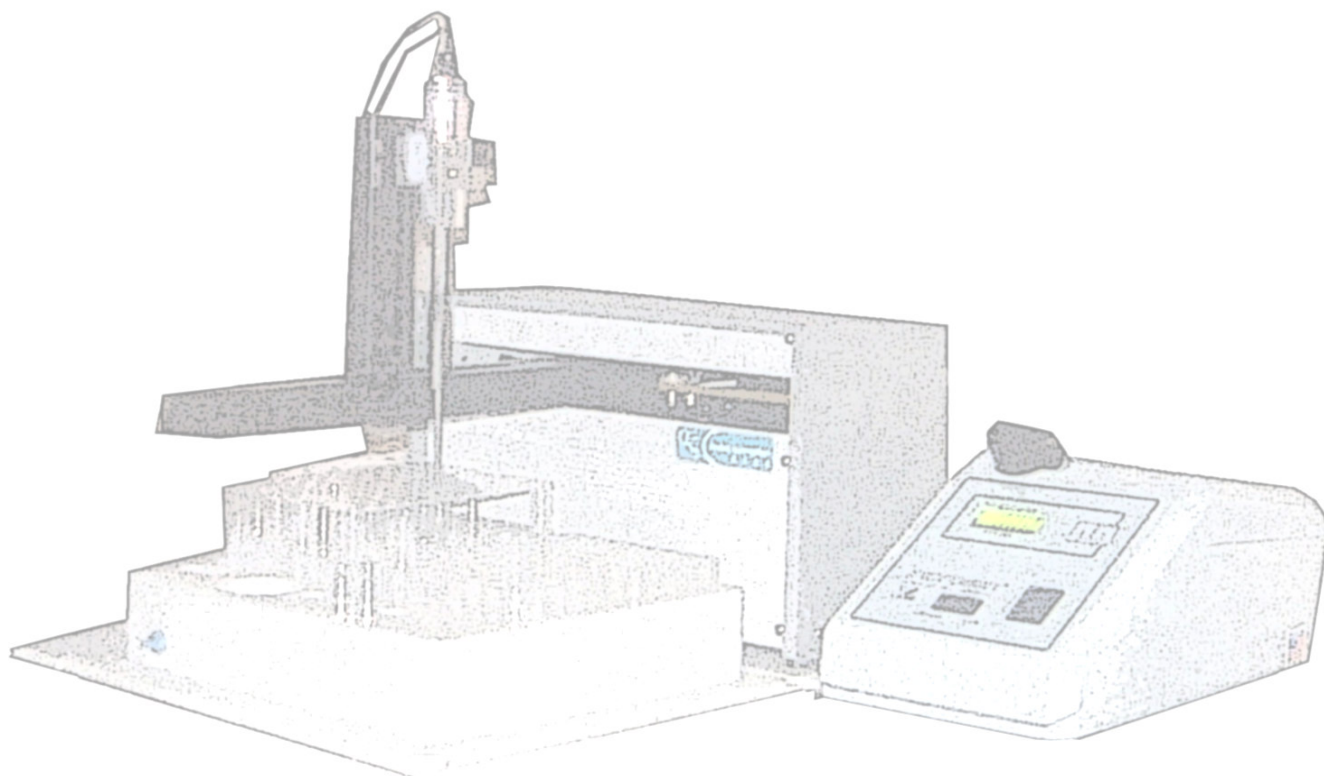
8100S

Sample Preparation

Automated Sonication

POC

The 8100S combines high energy sonication with an XYZ autosampler, ensuring the contents of a sample vial are quickly and thoroughly homogenized prior to analysis



Automated Sample Homogenization

Fast and Complete



**Combine the 8100S automated sonication system
with a TOC analyser to measure the Particulated
Organic Carbon fraction of an aqueous sample
(POC)**

- ✚ **Fast homogenization of samples**
- ✚ **Reproducible aliquots every time**
- ✚ **Prevents blockages of sample lines**
- ✚ **Avoids the need to filter samples**
- ✚ **Can reduce particles to sub-micron diameters**
- ✚ **Avoids settling out, ideal preparation for particulate laden samples**
- ✚ **Particularly suitable for ICP, AA, TOC and TN**
- ✚ **Integrity – measure the whole sample not just the filtered part**
- ✚ **Representative sample from anywhere in the vial**
- ✚ **Lysis of bacterial, fungal, mammalian and other types of cells**
- ✚ **Mixes, degasses and improves solubility**
- ✚ **May be PC controlled for integration with a main analysis system**

Sonication

A high energy ultrasonic generator produces an electrical signal at a particular frequency, transforming the electrical signal into mechanical vibration which is transmitted down the length of a Titanium probe.

When the probe is immersed in a liquid sample the rapid (i.e. 20 kHz) vibration of the probe tip causes cavitation - the formation and violent collapse of microscopic bubbles. The collapse of the bubbles releases tremendous energy into the liquid in the form of shock waves.

Particles in or near the cavitation field experience huge shear forces from the released energy and are broken up.

Automation

Combining a Sonicator with an XYZ auto-sampler provides an automated way of ensuring that each sample aspirated from a vial is representative of the contents of the whole vial.

A tray of vials is placed on the sampler base. Each vial is sonicated for a short period (typically 20 seconds). This will break down particulate to sizes small enough to be held in a homogenous suspension, without settling, for long periods.

The 8100S is a stand-alone sample preparation unit for use prior to measurement. It is housed in an acoustic enclosure and may also be PC controlled for integration with and as part of a main analysis system (e.g. TOC, TN, AA or ICP).

Analysis

Breaking down particulate avoids blockages of sample lines, prevents samples settling out and ensures that each aliquot aspirated from the same vial will give the same result.

After sonication, not only is the sample homogenous, but particles are small enough to travel along sample lines at the same velocity as the rest of the liquid sample.

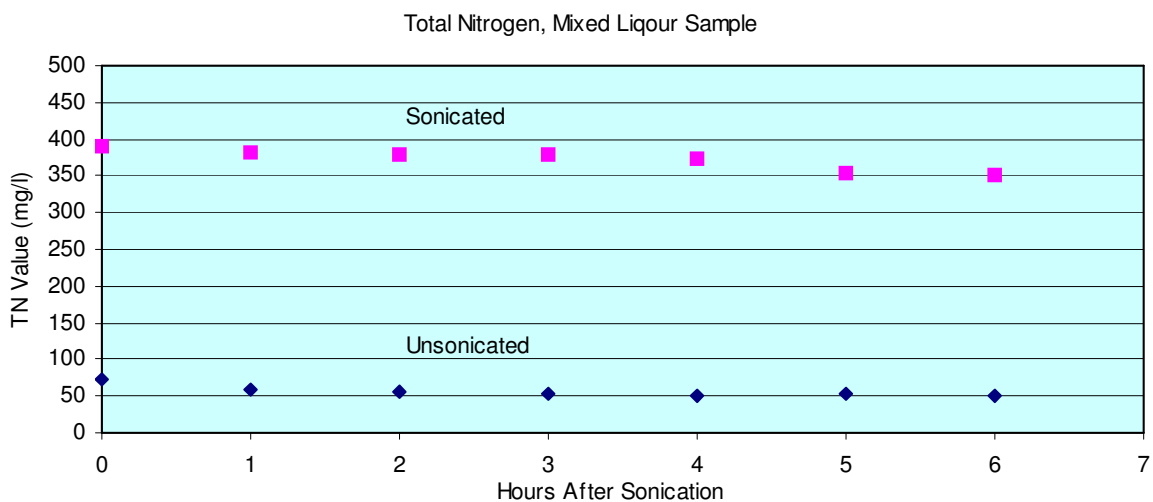
The 8100S is a stand alone sample prep device, but may also be PC controlled for integration with a main analyser (e.g. TOC, TN, ICP or AA).

Recovery

After sonication, waste and surface water samples typically show marked increases in the measurement of analytes such as TOC and TN. This is not just because particulate is better distributed inside the sample vial, but also because particulate is more easily delivered by an autosampler into the analyser.

The graph below shows the result of sonicating a mixed liquor effluent sample compared to a sample which has just been mechanically agitated.

The sonicated sample was not mechanically agitated after sonication showing how stable the emulsion has been made, even after the sample has been standing for six hours.

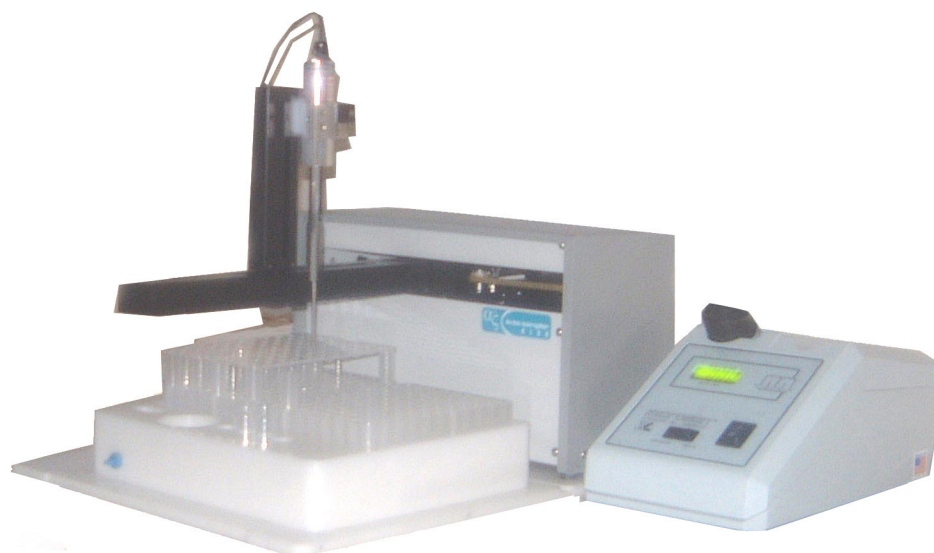


Sonication improved TN recovery by 542% compared to a mechanically agitated sample. Sampling was via a 0.8mm ID autosampler probe, using a Thermalox TN analyser. This directly injects the sample aliquot into a catalytic furnace.

User friendly Windows™ platform software allows the 8100S to be set up for different vial rack geometries and methods.

Analytical Sciences can provide software packages to integrate the 8100S with a main analyser

8100S



Vial processing time	User programmable, typically <20s
Maximum Vial Rack Size	300x300. Universal Mounting
Power Requirements	240/220/110 VAC, 50/60 Hz, 500w
Noise @ 1.0 m	<65 dB
Sonication Power	200watts
Probe Diameter	1/8", Titanium
Dimensions	575x430x480 DWH
Weight	35 kg
Probe Rinsing	Automatic, between vials
Accuracy(mm)	
Horizontal (XY)	<0.3
Vertical	<0.5
Positioning precision(mm)	
Horizontal (XY)	<0.1
Vertical	<0.2
Arm Speeds	
Horizontal (X/Y)	0.1-20.0 cm/sec
Vertical	0.1-8.1 cm/sec

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