

# UltraCarry

Aqueous liquid sample carrier for PPB trace element analysis

Replace ICP and AA wet chemistry methods  
with non-technical XRF trace elemental analysis



**Rigaku**

Leading With Innovation

Potassium	Calcium	Scandium	Titanium	Vanadium	Chromium	Manganese
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25
Atomic Weight = 39.10	Atomic Weight = 40.08	Atomic Weight = 44.96	Atomic Weight = 47.87	Atomic Weight = 50.94	Atomic Weight = 52.00	Atomic Weight = 54.94

# UltraCarry® for ppb-level aqueous analysis

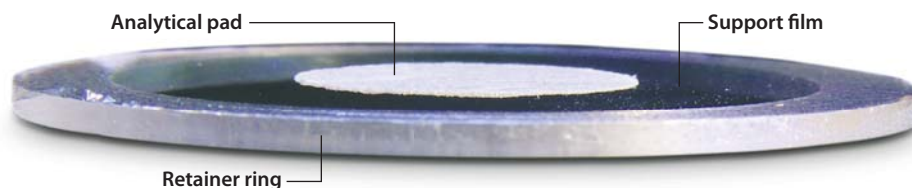
## Sample preconcentration system only from Rigaku

UltraCarry is a novel disposable (single-use) sample retainer for X-ray fluorescence (XRF) analysis used to preconcentrate an aqueous liquid sample onto a uniform sample carrier optimized for the suppression of background noise. This approach dramatically improves the signal-to-noise ratio, resulting in up to two orders of magnitude improvement in the Lower Limit of Detection (LLD or LOD) and Limit of Quantification (LOQ) for both light and heavy elements.

- **Analyze a wide range of elements**
  - $_{5}\text{B}$  to  $_{92}\text{U}$  (high power WDXRF)
  - $_{11}\text{Na}$  to  $_{92}\text{U}$  (EDXRF)
- **Parts-per-billion level elemental detection limits**
- **Simple 3-step process: pipette, dry and analyze**
- **Easy-to-use EZ Analysis user interface**
- **Minimal hazardous waste**
- **Non-technical operation**
- **No routine recalibration**
- **No gases or acids**
- **No digestion**
- **No filtration**

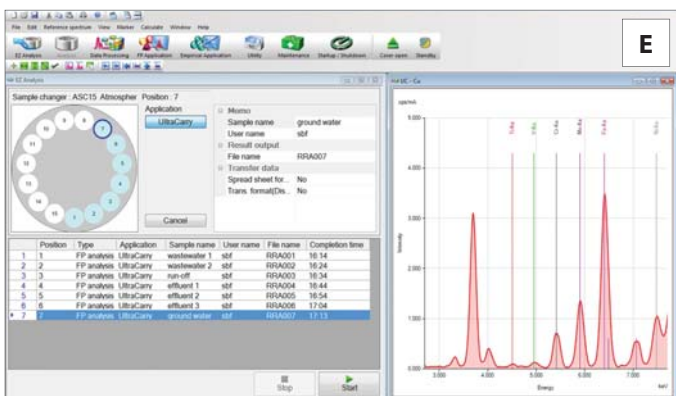
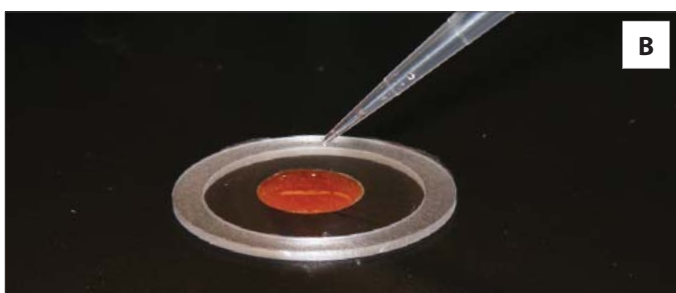
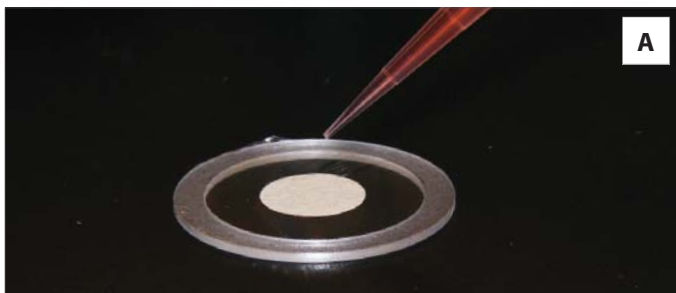
## Patented sample carrier

The UltraCarry sample retainer comprises a ring-shaped support fitted with an X-ray transmissive film and central analytical pad.



With the patented Rigaku UltraCarry, you can use your Rigaku wavelength dispersive X-ray fluorescence (WDXRF) spectrometer or energy dispersive X-ray fluorescence (EDXRF) spectrometer to quantify trace elements in aqueous liquids down to parts-per-billion (ppb) concentration levels. Routine elemental analysis of contaminated water or industrial wastewater can now be performed without an Atomic Absorption (AA) or Inductively Coupled Plasma (ICP) spectrometer. UltraCarry based trace element analysis is suitable for use by non-technical personnel.





## Simple 3-step procedure

Unlike with ICP or AA instrumentation, anyone can quickly learn to use UltraCarry to perform routine trace element analysis. No acids, no plumbing, no filtering, no gases, no digestion and nothing to clean.

1. **Pipette** your samples onto UltraCarry (A and B)
2. **Dry** multiple samples simultaneously with Rigaku UltraDry™ vacuum hotplate with special metal disks for rapid drying (C)
3. **Analyze** with Rigaku spectrometer (D and E)

For routine analysis, the Rigaku UltraDry vacuum hotplate (C) is recommended for rapid desiccation.

### Typical detection limits for UltraCarry using ZSX Series WDXRF\*

Element	LLD, ppb	Element	LLD, ppb
As	16	Fe	18
Pb	76	Co	17
Cr	26	Ni	20
Se	24	Cu	19
F	1 ppm	Zn	18
B	32 ppm	Sr	25
Cd	182	Mo	27
Na	76	Ag	152
P	56	Sn	40
K	12	Sb	43
V	34	Ba	105
Mn	16	Ti	81

\* 100 seconds per element measurement time

### Typical detection limits for UltraCarry using NEX CG EDXRF\*

Element	LLD, ppb	Element	LLD, ppb
As	65	Fe	40
Pb	55	Co	40
Cr	25	Ni	100
Se	40	Cu	75
F	N/A	Zn	40
B	N/A	Sr	40
Cd	130	Mo	220
Na	4 ppm	Ag	220
P	600	Sn	150
K	100	Sb	120
V	35	Ba	100
Mn	40	Ti	45

\* 600 seconds total measurement time

## Two types available

- **UltraCarry**
- **UltraCarry Light**
  - Superior performance for light elements



[www.Rigaku.com/products/xrf/ultracarry](http://www.Rigaku.com/products/xrf/ultracarry)



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