

SCOPE OF ACCREDITATION

Kinectrics Inc.
ANALYTICAL AND ENVIRONMENTAL SERVICES LABORATORY
800 Kipling Avenue, Unit 2
Toronto, ON
M8Z 6C4

Accredited Laboratory No. 235
(Conforms with requirements of CAN-P-1585, CAN-P-4E (ISO/IEC 17025:2005))

CONTACT: Dr. Andreas Rudolph
TEL: (416) 207-6000 ext. 6328
FAX: (416) 207-5550
EMAIL: andreas.rudolph@kinectrics.com
URL: www.kinectrics.com

CLIENTS SERVED: All Interested Parties

FIELDS OF TESTING: Biological, Chemical/Physical

PROGRAM SPECIALTY AREA: Environmental

ISSUED ON: 2011-12-01

VALID TO: 2014-02-15

ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY

Environmental

Air Filter

(Metals - Air)

TWI ICP_ICPMSXXXSOL

Sample preparation for determination of elements in solids (soils, deposits, etc.) or high organic content solutions by Inductively Coupled Plasma Atomic Emission or Mass Spectrometry

TWI ICPXX

Determination of metals in aqueous solutions by
ICPAES
Cd, Cr, Cu, Pb, Zn

Oil

(Cloud Point - Oil)

TWI CLOUD

Determination of cloud point of petroleum products by
visual observation
Cloud Point

(Corrosive Sulfur - Oil)

TWI CSC

Determination of corrosive sulphur in petroleum
products by measuring the copper corrosion
Corrosion

(Dielectric Strength - Oil)

TWI DIELBRKDOWN STRENGTH

Determination of breakdown voltage of insulating oil
by measuring the dielectric strength
Breakdown Voltage

(Dissolved Gas - Oil)

TWI GCGASTST

Determination of dissolved gases in oil by vacuum
extraction-gas chromatography
H₂, N₂, O₂, CO, CO₂, CH₄, C₂H₂, C₂H₄, C₂H₆

(Flash Point - Oil)

TWI FLASH POINT COC

Determination of flash/fire point of oils/organic liquids
by Cleveland Open Cup visual observation
Flashpoint

TWI FLASH POINT PMCC

Determination of flash point of oils/organic liquids by
Pensky-Martens by visual observation
Flashpoint

(Furan - Oil)

TWI 2-FURFURALDEHYDE_LC920

Determination of 2-furfuraldehyde in transformer oils
by liquid chromatography
2-Furfuraldehyde

(Interfacial Tension - Oil)

TWI INTERFACIAL TENSION
AUTO

Determination of interfacial tension at oil/water
interface by an automatic tensiometer
Interfacial Tension

(Neutralization Number - Oil)

TWI NEUT OR TAN NO

Determination of neutralization (total acid) number of
petroleum products by manual titration
Neutralization Number

(Particle Count - Oil)

TWI PART COUNT

Determination of particle count distribution in oils by
pressure flow decay
Particles 1-5u, 5-10u, 10-25u, 25-50u, 50-100u, >100u,
ISO-5, ISO-15

(PCB - Oil)

TWI GC_PCB_OIL

Determination of polychlorinated biphenyls in mineral
oil by Gas Chromatography - Electron Capture
Detection (GC-ECD)
Aroclors 1242, 1254, 1260

(Pour Point - Oil)

TWI POUR POINT

Determination of pourpoint of oil/petroleum products
by visual observation
Pourpoint

(Power Factor - Oil)

TWI POWERFAC

Determination of the power factor of oil by heat
dissipation
Power Factor

(RBOT - Oil)

TWI RPVOT

Determination of oxidation of oils by rotating pressure
vessel oxidation test
Oxidation Time

(Relative Density - Oil)

TWI RELATIVE DENSITY

Determination of density of oils relative to water by
API gravity

Relative Density

(Rust Test - Oil)

TWI RUST

Determination of rusting of ferrous components with oils by visual observation

Rust

TWI RUST 2 HDM

Determination of rusting of ferrous components with oils by visual observation (horizontal disk method)

Rust

(Trace Metals - Oil)

TWI TRACE ELEMENTS

Determination of trace elements in oils by rotating disk electrode atomic emission spectrometry

Al, Cr, Cu, Fe, Pb, Ni, Sn, B, Zn, P

(Viscosity @ 40°C - Oil)

TWI Auto-Viscosity

Determination of viscosity of oils and petroleum products by auto-viscosimeter

Dynamic Viscosity

(Water - Oil)

TWI KFWATER

Determination of water content of petroleum products and insulating paper by Karl Fischer titration

Water Content

Soil/Sediment**(Metals - Soil)**

TWI ICP_ICPMSXXXSOL

Sample preparation for determination of elements in solids (soils, deposits, etc.) or high organic content solutions by Inductively Coupled Plasma Atomic Emission or Mass Spectrometry

TWI ICPMSXX

Determination of metals in aqueous solutions by ICPMS

Ac, Al, Ag, Am, As, Au, B, Ba, Be, Bi, Br, Ca, Cd, Ce, Cl, Cm, Co, Cr, Cs, Cu, Dy, Eu, Er, Fe, Ga, Gd, Ge, Hf, Hg, Ho, I, In, Ir, K, La, Li, Lu, Na, Mg, Mn, Mo, Nb, Nd, Ni, Np, Pa, Pb, Pd, Pm, Pr, Pt, Pu, Ra, Rb, Re, Rh, Ru, S, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Tc, Te, Ti, Th, Tl, Tm, W, U, V, Y, Yb, Zn, Zr (all isotopes)

(PCB - Soil)

TWI GC_ASE_PCB_SOIL Determination of polychlorinated biphenyls in soil by Accelerated Solvent Extraction (ASE) - Gas Chromatography - Electron Capture Detection (GC-ECD)
Aroclors 1242, 1254, 1260

(Polycyclic Aromatic Hydrocarbons (PAH) - Soil)

TWI GC_ASE_PAH_SOIL Determination of polynuclear aromatic hydrocarbons in soil by Accelerated Solvent Extraction (ASE) - Gas Chromatography (GC-FID) and Mass Spectrometry
1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (g,h,i) perylene, Benzo (k) fluoranthene, Chrysene, Dibenzo (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-cd) pyrene, Naphthalene, Phenanthrene, Pyrene

(Total Petroleum Hydrocarbons - Soil)

TWI GC_ASE_PHC_SOIL Determination of total extractable petroleum Hydrocarbons (C₁₀ - C₅₀) by Accelerated Solvent Extraction (ASE) - Gas Chromatography (GC-FID)
PHC F2 (C₁₀-C₁₆), F3 (C₁₆-C₃₄), F4 (C₃₄-C₅₀)

TWI GC_EXTR_PHC_F1_SOIL Determination of volatile petroleum hydrocarbons (C₆ - C₁₀) in soil by methanol extraction direct-injection Gas Chromatography (GC-FID)
PHC F1 (C₆-C₁₀)

Water (Inorganic)

(Alkalinity - Water)

TWI ALKALINITY Determination of Alkalinity In Water By Autotitration
Alkalinity (pH 4.5)

(Ammonia - Water)

TWI CONH3 Determination of Ammonia In Aqueous Media By Colourimetry
Ammonia

(Chromium (VI) - Water)

TWI HEX_CHROMIUM

Determination of Hexavalent Chromium In Water By
Colourimetry
Chromium (VI)

(Conductivity - Water)

TWI CONDUCTIVITY

Determination of Conductivity In Water By Electrode
Conductivity (25°C)

(Dissolved Metals - Water)

TWI ICPMSXX

Determination of Metals In Aqueous Solutions By
ICPMS
Dissolved Ac, Al, Ag, Am, As, Au, B, Ba, Be, Bi, Br,
Ca, Cd, Ce, Cl, Cm, Co, Cr, Cs, Cu, Dy, Eu, Er, Fe, Ga,
Gd, Ge, Hf, Hg, Ho, I, In, Ir, K, La, Li, Lu, Na, Mg,
Mn, Mo, Nb, Nd, Ni, Np, Pa, Pb, Pd, Pm, Pr, Pt, Pu, Ra,
Rb, Re, Rh, Ru, S, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb,
Tc, Te, Ti, Th, Tl, Tm, W, U, V, Y, Yb, Zn, Zr (all
isotopes)

TWI ICPXX

Determination of Metals In Aqueous Solutions By
ICPAES
Dissolved Al, Ag, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce,
Cl, Co, Cr, Cs, Cu, Dy, Eu, Er, Fe, Ga, Gd, Ge, Hf, Ho,
In, Ir, K, La, Li, Lu, Na, Mg, Mn, Mo, Nb, Nd, Ni, Pb,
Pd, Pm, Pr, Pt, Ra, Rb, Re, Rh, Ru, S, Sb, Sc, Se, Si,
Sm, Sn, Sr, Ta, Tb, Te, Ti, Th, Tl, Tm, W, U, V, Y, Yb,
Zn, Zr

(Hydrazine - Water)

TWI CON2H4

Determination of Hydrazine In Water By Colourimetry
Hydrazine

(Major Anions - Water)

TWI IC_ANIONS_WATER

Determination of Inorganic Anions In Water By Ion
Chromatography
Bromide, chloride, fluoride, nitrate, nitrite, phosphate,
sulfate

(Mercury - Water)

TWI ICPMSHG

Determination of Mercury In Aqueous Solutions By
ICPMS
Mercury

(Morpholine - Water)

TWI GC_MORPHWATER Determination of Morpholine In Water By
Derivatization - Gas Chromatography Mass
Spectrometry (GC-MS)
Morpholine

(Organic Carbon - Water)

TWI TOC_DOC Determination of Organic Carbon In Water By
Combustion/Infrared Spectrometry
TOC, DOC

(pH - Water)

TWI PH Determination of pH In Water By Electrode
pH

(Silica (Reactive) - Water)

TWI COSIO2 Determination of Dissolved Molybdate - Reactive
Silica In Water By Colourimetry
Reactive Silica

(Solids - Water)

TWI TS_TDS_TSS Determination of Total Solids, Total Suspended Solids
And Total Dissolved Solids In Water By Gravimetry
Total Suspended Solids, Total Dissolved Solids, Total
Solids

(Total Metals - Water)

TWI ICPMSXX Determination of Metals In Aqueous Solutions By
ICPMS
Total Ac, Al, Ag, Am, As, Au, B, Ba, Be, Bi, Br, Ca,
Cd, Ce, Cl, Cm, Co, Cr, Cs, Cu, Dy, Eu, Er, Fe, Ga, Gd,
Ge, Hf, Hg, Ho, I, In, Ir, K, La, Li, Lu, Na, Mg, Mn,
Mo, Nb, Nd, Ni, Np, Pa, Pb, Pd, Pm, Pr, Pt, Pu, Ra, Rb,
Re, Rh, Ru, S, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Tc,
Te, Ti, Th, Tl, Tm, W, U, V, Y, Yb, Zn, Zr (all
isotopes)

TWI ICPXX Determination of Metals In Aqueous Solutions By
ICPAES
Total Al, Ag, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Cl, Co,
Cr, Cs, Cu, Dy, Eu, Er, Fe, Ga, Gd, Ge, Hf, Ho, In, Ir,
K, La, Li, Lu, Na, Mg, Mn, Mo, Nb, Nd, Ni, Pb, Pd,
Pm, Pr, Pt, Ra, Rb, Re, Rh, Ru, S, Sb, Sc, Se, Si, Sm,
Sn, Sr, Ta, Tb, Te, Ti, Th, Tl, Tm, W, U, V, Y, Yb, Zn,

(P&T) - Gas Chromatography - Mass Spectrometry
(GC-MS)

PHC F1 (C₆-C₁₀)

TWI GC_EXTR_EPH_WATER

Determination of Total Extractable Petroleum
Hydrocarbons (C₁₀ - C₅₀) In Water By Solvent
Extraction - Gas Chromatography (GC-FID)
PHC F2 (C₁₀-C₁₆), F3 (C₁₆-C₃₄), F4 (C₃₄-C₅₀)

(Volatile Organic Compounds (VOC) - Water)

TWI

ARCHON_GCMS_VOC_WATER

Determination of Volatile Organic Compounds In
Water By Automated Purge And Trap (P&T) - Gas
Chromatography - Mass Spectrometry (GC-MS)
Acetone, Acrolein, Acrylonitrile, Benzene,
Bromodichloromethane, Bromomethane,
Chlorobenzene, Chlorodibromomethane, Chloroethane,
Chloroethene, 2-Chloroethyl vinyl ether,
Chloromethane, Dibromoethene, 1,2-Dichlorobenzene,
1,3-Dichlorobenzene, 1,4-Dichlorobenzene,
1,1-Dichloroethane, 1,2-Dichloroethane,
1,1-Dichloroethene, *c*-1,2-Dichloroethene,
t-1,2-Dichloroethene, Dichloromethane,
1,2-Dichloropropane, *c*-1,3-Dichloropropene,
t-1,3-Dichloropropene, Ethylbenzene, Methyl ethyl
ketone, Methyl *i*-butyl ketone, Methyl *t*-butyl ether,
1,1,1,2,-Tetrachloroethane, 1,1,2,2,-Tetrachloroethane,
Tetrachloroethene, Tetrachloromethane, Toluene,
Tribromomethane, 1,1,1-Trichloroethane,
1,1,2-Trichloroethane, Trichloroethene,
Trichlorofluoromethane, Trichloromethane, Vinyl
Acetate, *o*-Xylene, *m/p*-Xylene

Water (Radiochemistry)

Water, Solids, Biota, Air Filters (Radiochemistry)

(Alpha Emitters - Feces)

TWI RALPHAFECAL

Determination of isotopes of uranium in feces by
ICPMS, determination of isotopes of plutonium,
americium and curium in feces by alpha spectrometry
²³⁴U, ²³⁵U, ²³⁸U, ²³⁸Pu, ^{239/240}Pu, ²⁴¹Am, ²⁴²Cm, ²⁴⁴Cm

(Alpha Emitters - Urine)

TWI RALPHAURINE

Determination of isotopes of uranium in urine by
ICPMS, determination of isotopes of plutonium,
americium and curium in urine by alpha spectrometry
²³⁴U, ²³⁵U, ²³⁸U, ²³⁸Pu, ^{239/240}Pu, ²⁴¹Am, ²⁴²Cm, ²⁴⁴Cm

TWI DM Acute Toxicity Determination of Acute Toxicity in Water using
Daphnia magna
Daphnia magna Pass/Fail or LC50 (48 h)

(Trout - Water)

TWI Trout Acute Toxicity Determination of Acute Toxicity in water using
Rainbow Trout
Rainbow Trout Pass/Fail or LC50 (96 h)

Notes:

CAN-P-4E (ISO/IEC 17025): General Requirements for the Competence of Testing and Calibration Laboratories ISO/IEC 17025-2005)

CAN-P-1585: Requirements for Accreditation of Environmental Testing Laboratories

9#-XXXXX, 740-###, RXX-##: Subject Laboratory In-House Test Methods

S. Cross, Director, Conformity Assessment

Date: 2011-12-01

Number of Scope Listings: 62

SCC 1003-15/313

Partner File #0

Partner: SCC