 <p>Reference Material TS EN ISO 17034 AB-0001-RM</p>	TÜBİTAK ULUSAL METROLOJİ ENSTİTÜSÜ (UME) Accreditation Nr: AB-0001-RM Revision Nr: 03 Date: 20.09.2021	
	Reference Material Producers Address : TÜBİTAK ULUSAL MET. ENS. NO:X GEBZE Kocaeli / Türkiye	
	Phone : +90 262 679 5000 Fax : - Email : ume@tubitak.gov.tr Website : www.ume.tubitak.gov.tr	

Reference Material Producer		
Material Type (RM / CRM) Material / Matrix	Characterized Values / Parameters	Characterization Procedure / Technique
CRM Chloramphenicol	Purity	Two or more independent reference methods in one or several laboratories / High Performance Liquid Chromatography-Diode Array (HPLC-PDA) Coulometric Karl Fisher (cKFT) Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Quantitative Nuclear Magnetic Resonance (qNMR)
CRM Diesel	Cold Filter Plugging Point (CFPP)	Two or more independent reference methods in one or several laboratories / EN 116
CRM Diesel	Density	Two or more independent reference methods in one or several laboratories / EN ISO 12185
CRM Diesel	Kinematic Viscosity	Two or more independent reference methods in one or several laboratories / EN ISO 3104
CRM Diesel	Distillation (Recovery at 250 °C & 350 °C 5 % recovery temperature 10 % recovery temperature 20 % recovery temperature 30 % recovery temperature 40 % recovery temperature 50 % recovery temperature 60 % recovery temperature 70 % recovery temperature 80 % recovery temperature 90 % recovery temperature 95 % recovery temperature)	Two or more independent reference methods in one or several laboratories / EN ISO 3405
CRM Diesel	Cetane Index	Two or more independent reference methods in one or several laboratories / EN ISO 4264
CRM Diesel	Flash Point	Two or more independent reference methods in one or several laboratories / EN ISO 2719
CRM Diesel	Mass Fraction of Sulfur	A single (primary) method in a single laboratory / High Resolution Inductively Coupled Plasma Mass Spectrometry (HR-ICP-MS) Isotope Dilution Mass Spectrometry (ID-MS)
CRM Spring Water	Mass Fraction of Al As B Ba Ca Cd Co Cr Cu Fe K Mg Mn Na Ni P Pb Sb Sn Sr Zn	Two or more independent reference methods in one or several laboratories / Graphite Furnace Atomic Absorption Spectrometry (GFAAS): As, Ba, Cd, Cr, Cu, Ni, Pb Flame Atomic Absorption Spectrometry (FAAS): Mg, Na, Zn Atomic Emission Spectrometry (AES): Al, B, Ba, Co, Cu, Fe, K, Mg, Na, Ni, P, Sr, Zn Inductively Coupled Plasma Mass Spectrometry (ICP-MS): Al, As, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sb, Sn, Sr, Zn Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES): Al, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sr, Zn




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CRM Reference pH Buffer Solutions	pH	A single (primary) method in a single laboratory / Primary pH Measurements (Harned Cell)
CRM Waste Water	Mass Fraction of As B Cd Cu Co Cr Fe Hg Mn Ni V Zn	Two or more independent reference methods in one or several laboratories and/or A single (primary) method in a single laboratory / Graphite Furnace Atomic Absorption Spectrometry (GFAAS): As, Co, Mn, Ni, V Inductively Coupled Plasma Mass Spectrometry (ICP-MS): As, B, Co, Mn, Ni, V, Zn Isotope Dilution Mass Spectrometry (ID-ICPMS): B, Cd, Cr, Cu, Fe, Hg, Zn
CRM Dried Fig	Mass Fraction of Aflatoxin B1 Aflatoxin B2 Aflatoxin G1 Aflatoxin G2 Total Aflatoxin	Two or more independent reference methods in one or several laboratories and/or A single (primary) method in a single laboratory / High Performance Liquid Chromatography - Fluorescence Detection (HPLC-FLD) Isotope Dilution Liquid Chromatography High Resolution Mass Spectrometry (ID-LC-HRMS)
CRM Colemanite	Mass Fraction of Al As B Ca Fe Mg Na Sr S Si	Using two or more independent reference methods in one or more laboratory and/ or Using single reference measurement procedure in a single laboratory/ Flame Atomic Absorption Spectrometry (FAAS): Ca, Mg, Na, Si Graphite Furnace Atomic Absorption Spectrometry (GFAAS): Al Hydride Generation Atomic Absorption Spectrometry (HGAAS): As Inductively Coupled Plasma Mass Spectrometry (ICP-MS): Al, As, Ca, Fe, Mg, Na, Si Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICPMS): B, Fe, S, Sr
CRM Soil	Mass Fraction of As Cd Co Cr Cu Fe Mn Ni Pb Sb Zn Hg V	Using two or more independent reference methods in one or more laboratory and/or Using single reference measurement procedure in a single laboratory/ Atomic Absorption Spectrometry (AAS): Fe Cold Vapor Atomic Absorption Spectrometry (CVAAS): Hg Inductively Coupled Plasma Mass Spectrometry (ICP-MS): As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Sb, V, Zn Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICPMS): Cd, Cr, Fe, Hg, Ni, Pb, Zn Isotope Dilution Thermal Ionization Mass Spectrometry (ID-TIMS): Cu, Pb Microwave Plasma Atomic Emission Spectrometry (MP-AES): Co, Cr, Cu, Fe, Mn, Ni, Pb, V, Zn k0-Instrumental Neutron Activation Analysis (k0-INAA): As, Co, Cr, Fe, Hg, Mn, Sb, V, Zn
CRM River Water	Mass Fraction of As Cd Ni Pb Se	Using two or more independent reference methods in one or more laboratory and / or Using single reference measurement procedure in a single laboratory / Anodic Stripping Voltammetry (ASV): Cd, Pb Inductively Coupled Plasma Mass Spectrometry (ICP-MS): As, Cd, Ni, Pb Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICPMS): Cd, Ni, Pb, Se Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES): As, Cd, Ni, Pb
CRM Sea Water	Mass Fraction of As Cd Cr Cu Fe Ni Pb Zn	Using single reference measurement procedure in a single laboratory / Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICPMS) : Cd, Cr, Cu, Fe, Ni, Pb, Zn Matrix Matched Standard Addition Inductively Coupled Plasma Mass Spectrometry (SA-ICPMS): As
CRM Ground Water	Mass Fraction of PFOS and PFOA	Using single reference measurement procedure in a single laboratory and / or Using two or more independent reference methods in one or more laboratory / Isotope Dilution Liquid Chromatography High Resolution Mass Spectrometry (ID-LC-HRMS)



Accreditation Scope

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CRM Hazelnut	Mass Fraction of B Ca Cd Co Cu Fe Mg Mn Ni Sr Zn	Two or more independent reference methods in one or several laboratories and/or A single (primary) method in a single laboratory / Flame Atomic Absorption Spectrometry (FAAS): Ca, Mg Graphite Furnace Atomic Absorption Spectrometry (GFAAS):Co, Mn, Ni, Sr Inductively Coupled Plasma Mass Spectrometry (ICP-MS): B, Ca, Co, Cu, Fe, Mg, Mn, Ni, Sr, Zn Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICP-MS): B, Cd, Cu, Fe, Zn
CRM Lyophilized Serum	Mass Fraction of 25-hydroxy vitamin D ₂ 25-hydroxy vitamin D ₃	A single (primary) method in a single laboratory / Isotope Dilution Liquid Chromatography High Resolution Mass Spectrometry (ID-LC-HRMS)
CRM Colemanite	LOI	Using single reference measurement procedure in a single laboratory/ Modified TS 3245 Standard Gravimetric Measurement of mass loss after ignition at 950 °C
CRM Fish	Mass Fraction of • As • Ca • Cu • Fe • Hg • K • Mg • Na • P • Se • Zn	Using two or more independent reference methods in one or more laboratory and / or Using single reference measurement procedure in a single laboratory / Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICPMS) : Cu, Fe, Hg, Se, Zn Inductively Coupled Plasma Mass Spectrometry (ICPMS): As, Ca, Mg, K, P Hydride Generation Atomic Absorption Spectrometry (HG-AAS):As Inductively Coupled Plasma Optical Emission Spectrometry (ICPOES): Ca, Mg, K, P
CRM Sucrose Fructose Glucose Honey (unadulterated) Honey (adulterated)	Ratio of Stable Isotopes ¹³ C Delta values	Two or more independent reference methods in one or several laboratories / Elemental Analyser-Isotope Ratio Mass Spectrometry (EA-IRMS)
CRM Lyophilized Plasma	Mass Fraction and Molar Concentration of Alanine 2-Aminoadipic acid 2-Aminobutyric acid Anserine Arginine Argininosuccinic acid Asparagine Aspartic acid Beta-alanine Citrulline Cystathionine 4-Aminobutyric acid Glutamic acid Glycine Histamine Histidine Hydroxyproline Isoleucine Leucine Lysine Methionine N-methylhistidine Ornithine Phenylalanine Proline Serine Threonine Tyrosine Valine Ethanolamine Creatinine Sarcosine	Using single reference measurement procedure in a single laboratory / Isotope Dilution Liquid Chromatography High Resolution Mass Spectrometry (ID-LC-HRMS)



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CRM Urine	Mass Fraction and Molar Concentration of 2-Methylcitric acid 3-Hydroxy-3-methylglutaric acid N-(3-Methylcrotonyl)glycine Adipic acid 2-Hydroxyglutaric acid 2-Ketoglutaric acid 3-Hydroxybutyric acid 3-Hydroxyisovaleric acid Citric acid Fumaric acid Glutaric acid Glycolic acid 2-Ketoisovaleric acid Lactic acid Methylmalonic acid 3-Methylglutaric acid N-Acetylaspartic acid Orotic acid 2-Hydroxyphenylacetic acid Pimelic acid Pyruvic acid Sebacic acid Suberic acid Succinic acid N-Suberylglycine N-Tiglylglycine Mandelic acid 5-Hydroxyindole-3-acetic acid N-Hexanoylglycine N-(3- Phenylpropionyl)glycine Mevalonolactone 2-Ketobutyric acid 2-Ketocaproic acid Propionylglycine 2-Keto-3-methylvaleric acid Malic acid Benzoic acid Tartaric acid Arabitol Kynurenic acid 4-Hydroxybenzoic acid Hippuric acid 2-Methylhippuric acid Xanthurenic acid 3-Indoleacetic acid Vanillomandelic acid Phenylglyoxylic acid	Using single reference measurement procedure in a single laboratory / Isotope Dilution Liquid Chromatography High Resolution Mass Spectrometry (ID-LC-HRMS)
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This document has been signed by Gülden Banu Müderrisoğlu with a secure electronic signature in accordance with the electronic signature law numbered 5070. Use the QR code to verify the e-signed document.

