



# *SHRADDHA* **ANALYTICAL SERVICES**

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**DR. KETAN MERCHANT**

**AN ISO 9001 : 2015 CERTIFIED COMPANY**

**Shraddha Analytical Services** cater to **Instrumental , Chemical and Microbiological Analysis** in the field of Fine Chemicals, Perfumery, Dyes and Intermediates, Cements & Fly Ash, Pharmaceutical Intermediates, Textile Auxiliaries and Chemicals, Paint, Polymers, Pigment Analysis, etc. If you are looking for Quality and Timely Analytical services under one roof we can undertake your job including Method development & data interpretation.

Be it a Compendial method, an In-house protocol or even a special Analytical requirement, *Shraddha Analytical Services* will complete each procedure on time as needed.

**Our Customers call it 'Flexibility'; We call it 'Good Business'.**

**One Source Problem Solving, What does this mean for the Customer ?**

One Source problem solving means that *Shraddha Analytical Services* be a Single Source for Comprehensive Analysis and Testing which includes Problem Solving, Method Development & Routine Testing.

**M/s. *Shraddha Analytical Services* is equipped with Modern instrumentation like**

**Inhouse Instrumentation Includes :**

**GC with Autosampler (Agilent Technologies 7820 A)**

**GC-Head Space Sampler (Agilent Technologies GC 7820A – Head space sampler 7697A)**

**GCMS (Agilent Technologies GC 7890B - MS 5977A)**

**Gel Permeation Chromatography (GPC) - 1260 Infinity II -RI Detector**

**ICP-OES (Agilent 5110)**

**HPLC – Agilent 1260 Infinity II with Column Oven, Cooling facility and Autosampler & UV-Vis detector.**

**Ion Chromatography From Metrohm, (IC 925)**

**HPLC from Thermo Separation Products with Autosampler and Diode Array Detector**

**Surface Tensiometer - Platinum Ring Method**

**Nesseluriser-Colour by APHA-5-250 Hazen Units.**

**Brookefield Viscometer-LVT-1-Dial Type and Automatic with Temperature Controller - LVDV-II**

**Bomb Calorimeter - Rajdhani**

**Karl Fisher Titrator - Veego Matic-D**

**Melting Point/Boiling Point Apparatus - Veego VMP DS**

**Flash Point Apparatus - Pensky Martin Closed Cup**

**Conductivity Meter - Equiptronics 660A**

**TDS Meter - Equiptronics**

**Turbidimeter - EQ 811**

**With Access to :**

**AAS, LC-MS, ICP-MS,**

**Particle Size (By Malvern Mastersizer 2000,3000. Sympatec, Zetasizer, Coulter),**

**Surface Area by BET Analyser, XRD - BRUKER and PAnalytical with Interpretation of Inorganics Mixture, XRF, NMR, CHNS, DSC, TGA, DTA, SEM, TEM, EDAX, TEM, TOC.**

We provide customers with high quality problem solving & consulting services in developing methods in Chromatography with the State of the Art Instrumentation and Well Trained Staff. We are specialized in unknown Chemical Identification.

## **WE CATER TO FOLLOWING INDUSTRIES.**

- 1. Perfumery, Essential Oil & Fragrance & Flavors**
- 2. Oil, Coal, Fuels & Petrochemicals**
- 3. Pharmaceutical Intermediates**
- 4. Dyes and Intermediate**
- 5. Industrial & specialty Fine chemicals**
- 6. Environmental**
- 7. Cementous Materials & Fly Ash**
- 8. Plastic & Polymers. Etc.**

## **CASE STUDIES :-**

Shraddha Analytical Services has performed Specialized Analysis such as

- Coal / Fuel Analysis [ Proximate & Ultimate Analysis)
- Essential Oils / Flavors / Fragrance & Perfumery Analysis
- Oils / Used Oils Analysis (Acid / Hydroxyl / Saponification / Ester Value )
- Free Formaldehyde Content
- Polymer & Filler Identification
- Fumed Silica / Cement Analysis
- Effluent water Analysis, COD / BOD Etc
- Complete Water & Waste Water Analysis
- Organic / Inorganic Unknown Identification
- Color Fastness to Light / Xenon Exposure
- Pentachlorophenol (PCP) Content by GC- ECD
- Organo Chlorine / Pesticides Content by GC-ECD
- Poly Aromatics Hydrocarbons (PAHs) By GC-MS
- Aryl amines in Azo Dyes by GCMS
- Organotin, BHT, Bisphenol A by GC-MS
- Available Chlorine Content in Sodium Hypochlorite
- Fatty Acids Methyl Esters (FAME) Analysis By GC-Capillary
- Lab Values, Whiteness Index, Yellowness Index, Brightness Index By Mac Beth Color Matching System
- Polychlorinated Biphenyls (PCB'S) & Polychlorinated Diphenyl Ethers(PCDE) By GCMS
- Formaldehyde, Glyoxal, Furan by HPLC
- Hexavalent Chromium Analysis by UV

## Major Instrumentation & Instrumental Analysis :-

### 1. Gas Chromatography (GC) ( Agilent Technologies GC 7820A - Head space sampler 7697A )



Detectors - FID / ECD/NPD/FPD  
With the Range of 65 Capillary Columns.

- ☐ Method Development.
- ☐ Method Validation.
- ☐ Quantification.
- ☐ Organic Volatile Impurities / Residual Solvents by Head Space.

### 2. High Performance Liquid Chromatography (HPLC – Agilent 1260 Infinity II) With Column Oven with Cooling Facility, Autosampler and UV-Vis Detector.



Detectors - UV - Visible Detector / Photo Diode Array Detector (PDA) / Refractive Index (RI)/ELSD  
With C8/C18, Cyano, Phenyl, Chiral and other HPLC Columns.

- ☐ Method Development.
- ☐ Method Validation.
- ☐ Quantification.
- ☐ Chiral Separations.  
[ Columns - Chiralcel OD-R , MA+ , Chiralpak IA, Chiralcel OJ-H, Chiralcel OD-H]

### 3. Gas Chromatography Mass Spectrometry (GC-MS) ( Agilent Technologies GC 7890B - MS 5977A )



- ☐ GC-MS. (For Mol. Wt. up to. 600) – NON POLAR COLUMN.
- ☐ HEAD SPACE - GCMS
- ☐ MS - DIP. (For Mol. Wt. up to 2000)
- ☐ LC-MS & LC-MS-MS .

### 4. Gel Permeation Chromatography (GPC) – Agilent 1260 Infinity II with RI Detector.



- ☐ Room Temperature - Aqueous Molecular weight up to 1 lakh.
- ☐ Room Temperature - THF / CHCl<sub>3</sub> up to 4 lakh.

## 5. ICP-OES ( Agilent Technologies 5110 )



Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, In, K, Li, Mg, Mn, Mo, Na, Nb, Ni, Pb, Rb, Sb, Sc, Se, Sr, Ti, Tl, U, V, Zn, Au, Ir, Pd, Pt, Rh, Ru.

## 6. UV - Visible Spectroscopy (UV-Vis) -



## 7. Fourier Transform Infra Red Spectroscopy (FTIR-ATR)

Model : Bruker Optik Alpha-T-FTIR Spectrometer



## 8. Nuclear Magnetic Resonance Spectroscopy (NMR) - Bruker



- ☐ Proton NMR – 300, 400 MHz.
- ☐ Carbon 13 NMR – 300, 400 MHz
- ☐ Phosphorus NMR
- ☐ Fluorine NMR

## 9. X - Ray Diffraction (XRD) – PAnalytical Netherlands.



2 Theta Range - 4 to 60 & 4 to 80 / Crystallinity

**10. Thermogravimetry Analysis (TGA) – Mettler.  
(From Ambient to 890 deg C)**



- ☒ Purity.
- ☒ Thermal Stability.
- ☒ Oxidation Stability.
- ☒ Pseudopolymorphism.
- ☒ Analysis of Composition.
- ☒ Kinetics of Decomposition.
- ☒ Evaporation / Desorption / Vaporization.

**11. Differential Scanning Calorimetry (DSC) – Mettler  
(- 30 deg C to 490 deg C)**



- ☒ Purity.
- ☒ Specific Heat.
- ☒ Heat of Fusion.
- ☒ Polymorphism
- ☒ Melting Point .
- ☒ Melting Range.
- ☒ Melting Behavior.
- ☒ Glass Transition.
- ☒ Thermal Stability.



## 12. X - Ray Fluorescence (XRF) - Horiba



- ☐ Elements – From Sodium to Uranium in the Periodic Table.- Semi Quantitative- ( Inorganic Samples )

## 13. Elemental Analysis Using Elemental Analyzer. - Thermo



- ☐ C, H, N, S,O Analysis.

## 14. Particle Size Analysis By Malvern Mastersizer.- 2000, 3000. (Laser Diffraction based with Dry Powder Feeder Attachment).

Coulter Instrument, Sympatec.



- ☐ 20 nm to 3000 microns

## 15. TOC Analysis - Shimadzu



## 16. Ion Chromatography - Metrohm ECO IC 925



- ☐ Anions - Chloride, Bromide, Fluoride, Nitrite, Nitrate, Phosphate, Sulphate
- ☐ Cations - Sodium, Lithium, Potassium, Calcium, Magnesium, Ammonium, Manganese

## 17. Surface Area Analysis by BET.



18. SEM – EDAX
19. Scanning Electron Microscopy (SEM)
20. Transmission Electron Microscopy (TEM )
21. Porosity Measurement by Mercury Porosimeter
22. Surface Tension by Surface Tensiometer - Platinum Ring Method

**Other Analysis :-**

- ☐ Pour Point
- ☐ Cloud Point
- ☐ Flash Point
- ☐ Aniline Point
- ☐ Calorific Value
- ☐ Color by APHA
- ☐ Bulk Density
- ☐ Specific Gravity
- ☐ Specific Optical Rotation
- ☐ Surface Tension Analysis
- ☐ Melting Point / Boiling Point
- ☐ Moisture Content by K.F. (Karl Fischer)
- ☐ Refractive Index by Abbe Refractometer
- ☐ Kinematic Viscosity at 40 & 100 Deg C
- ☐ Viscosity by Brook Field Viscometer / Ford Cup / Red Wood / U Tube
- ☐ Acid Value / Sap Value / Iodine Value / Ester Value
- ☐ Ash / Sulphated Ash / Acid Insoluble Ash
- ☐ Loss on Drying

## **Environmental / Water Analysis :-**

- ☐ Color
- ☐ Odor
- ☐ Turbidity (NTU)
- ☐ Transparency of Water / Waste Water
- ☐ Electrical Conductivity
- ☐ Salinity
- ☐ pH
- ☐ Total Dissolved Solids
- ☐ Total Solids
- ☐ Total Suspended Solids
- ☐ Nitrite
- ☐ Fluoride
- ☐ Total Hardness as CaCO<sub>3</sub>
- ☐ Chloride as Cl
- ☐ Sulphate as SO<sub>4</sub>
- ☐ Sulphide
- ☐ Ammonical Nitrogen
- ☐ Iodine
- ☐ Bromine
- ☐ Chlorine
- ☐ Chromium ( Hexavalent )
- ☐ TOC
- ☐ COD / BOD

## **Fertilizer Analysis :-**

- ☐ Moisture
- ☐ Particle size
- ☐ Total Phosphate
- ☐ Water Soluble Phosphate
- ☐ Water soluble Potash
- ☐ Acidity
- ☐ Alkalinity
- ☐ Sieve Test
- ☐ Insolubility in acetone
- ☐ Bulk Density
- ☐ Flash point
- ☐ Micronutrients [ Iron, Copper, Zinc, Magnesium, Manganese, Arsenic, Sulfur ]

### **Thermic Fluid Analysis :-**

- ☐ Specific Gravity
- ☐ Specific heat at ambient & at 300 deg.C
- ☐ Boiling Point.
- ☐ Flash point for thermal stability.
- ☐ Viscosity Index.
- ☐ Moisture content.
- ☐ Copper Strip Corrosion
- ☐ Neutralization Number – mg KOH /gm

### **Coal Analysis :-**

- ☐ Gross Calorific Value
- ☐ Total Moisture
- ☐ Inherent Moisture
- ☐ Ash Content
- ☐ Volatile Matter
- ☐ Fixed Carbon
- ☐ Total Sulfur by ICP
- ☐ Ultimate Analysis ( C,H,N,S)

### **Waste Oil Analysis :-**

- ☐ Sediment
- ☐ Sulphur by ICP
- ☐ Lead by ICP
- ☐ Arsenic by ICP
- ☐ Cadmium by ICP
- ☐ Chromium by ICP
- ☐ Nickel by ICP
- ☐ Water Content by Karl fisher

## **Petroleum Products & Fuel Analysis :-**

- ☐ Density
- ☐ Carbon Nos. by GC-Capillary
- ☐ Flash Point
- ☐ Kinematic Viscosity
- ☐ Ash
- ☐ Copper Corrosion Test
- ☐ Gross Calorific Value
- ☐ Sulfur Content
- ☐ Aniline Point
- ☐ Sediment
- ☐ Cloud Point / Pour Point
- ☐ Carbon Residue
- ☐ Water Content
- ☐ Acidity
- ☐ Distillation

## **Plastic & Polymer Analysis :-**

- ☐ Identification of Plastic Material by DSC [ PP, LDPE, HDPE, Polyacetal, PET, PBT, Nylon 6, Nylon 66, Nylon 610, PVC, PS, PMMA)
- ☐ % Filler Content
- ☐ Identification of Filler
- ☐ Polymorphism.
- ☐ Glass Transition(Tg)
- ☐ Heat Capacity
- ☐ Melting Peak
- ☐ Volatiles.(Moisture, Solvents, Monomers)
- ☐ Polymer Decomposition
- ☐ Residue(Ash, Fillers, Glass Fibres)
- ☐ Flexural Strength
- ☐ Izod Impact
- ☐ Melt Flow Index
- ☐ Specific Gravity
- ☐ Elongation at Break
- ☐ LOI - Limiting Oxygen Index.

## **Perfume / Flavors & Fragrances Analysis :-**

- ☐ GC / GCMS – Identification of Components eluted in GC.
- ☐ Density / Specific Gravity
- ☐ Solubility
- ☐ Refractive Index
- ☐ Color by APHA
- ☐ Optical Rotation

## **Cementous Material & Fly Ash Analysis :-**

- ☐ Particle Size Analysis
- ☐ Finesse [ Retention on 45 u Sieve ]
- ☐ Bulk Density / Specific Gravity
- ☐ LOI
- ☐ XRF

## **Electric Components Analysis :-**

- ☐ Chloride, Bromide, Phosphate, Sulphate by Ion Chromatography
- ☐ Pb, Cd, Hg by ICP
- ☐ Hexavalent Chromium by U.V
- ☐ PBB & PBDE by GCMS

## **Pigment Analysis :-**

- ☐ Oil absorption (ml/100g)%
- ☐ pH Value
- ☐ Viscosity at 25.C
- ☐ Density at 25.C(g/cm<sup>3</sup>)
- ☐ Light Fastness
- ☐ Heat Resistance
- ☐ Water Resistance
- ☐ Acid Resistance
- ☐ Alkyl Resistance

## Microbiological Analysis :-

Sr. No.	Product	Test Title	Test Method
1.	Chemicals / Any Antimicrobial Formulations	Minimum Inhibitory Concentration (MIC) for any one organism; Tube Method	ASTM Methods
2.	Chemicals / Any Antimicrobial Formulations	Minimum Bactericidal Concentration (MBC) for any one organism; Plate Method	ASTM Methods
3.	Chemicals / Any Antimicrobial Formulations	Antifungal Activity by Plate Method	ASTM Methods
4.	Chemicals / Any Antimicrobial Formulations	Time Kill Test using Bacteria, Fungi & Algae for two organisms	API RP-38 Method 2002
5.	Chemicals	Antimicrobial Preservative Effectiveness for two organisms	Preservative Challenge Test
6.	Polymeric Materials	Determining Resistance of Synthetic Polymeric Materials to Fungi	ASTM: G-21
7.	Paints	Resistance to growth of mold on the surface of interior paint coatings in an environmental chamber (Evaluation of Antifungal activity of paint samples on applied surfaces)	ASTM D 3273-05
8.	Paints	Evaluating Degree of Surface Disfigurement of Paint Films by Microbial Growth (Fungal or Algal) on soil & Dirt Accumulations	ASTM D 3274-2002
9.	Paints	To assess the performance of in-can Preservatives; Qualitative method	Oxford Cylinder cup bioassay
10.	Paints	To assess the performance of preservative in exterior paint; Qualitative method	Filter Paper Method
11.	Textile Material	Antibacterial activity of fabrics assessment of textile materials- Parallel Streak Method	AATCC-147-2004
12.	Textile Material	Antibacterial Finishes on textile materials	AATCC-100-2004



13.	Textile Material	Determining the Antimicrobial activity of Immobilized Antimicrobial agents under Dynamic contact conditions	ASTM: E2149-01
14.	Textile Material	Evaluation of Antibacterial activity of textile Materials: Agar Diffusion Plate Test	ISO 20645-2004
15.	Textile Material	Determination of population of Microorganism on Product	IS; ISO/FDIS 11737-1; Part 1; 2005
16.	Textile Material	Testing of antibacterial activity and Efficacy on Textile products	JIS L 1902:2002
17.	Non Textile Material	Antimicrobial Products- Test for antimicrobial activity and Efficacy- on Non textile substrates such as plastic glazed surfaces	JIS Z 28.1-2000
18.	Textile Material	Mosquito Repellency	U.S. Patent 5,198,287
19.	Textile Material	Mosquito Repellency	Modified WHO/CTD/WHO PES/IC/96.1
20.	Textile Material	Assessment of Dust Mite Properties of Textiles	AATCC Test Method Draft 5, Jan 2005
21.	Textile Material	Assessment of Antifungal Activity of Textile Materials	MIL-STD-810F Method 508.5.1-12 January 2000
22.	Textile Material	Assessment of Antifungal Activity of Textile & other Materials	AATCC Test Method 30 III 1998
23.	Any Surface or Material Contaminated with Microbes	Identification of Pathogenic Bacteria/ Fungi/ Protozoa, Cysts	Bergy's Manual of Determinative Bacteriology 2000; ASM Manual
24.	Factory or Manufacturing Premises	Environmental Sampling of factory/ Manufacturing premises/ Production house	HICC Guidelines, 2002
25.	Factory or Manufacturing Premises	Microbiological surveillance of O.T/ Factory premises/ Laboratory areas	HICC Guidelines, 2002

26.	Water Samples	Drinking Water/ Swimming Pool water	IS 1622
27.	Food Samples	Total Bacterial Count	IS 5402: 2002/ ISO 4833:1991
28.	Food Samples	Total Yeast & Mould Count	IS 5403: 1999 Reaffirmed 2005/
29.	Food Samples	Detection of Pathogens such as- Coliforms, E. coli, Pseudomonas aeruginosa, Staphylococcus aureus, Salmonella typhi, Bacillus cereus, Streptococci	IS Standards
30.	Chemicals	In Vitro Cytotoxicity test. This test is done on Mouse kidney cell lines. We use L929 cell lines. It can be done by Qualitative test and Quantitation test. Quantitation is done by MTT assay. The test method is EN ISO 10993 -5: 2009. Result - Toxic/ Non toxic quantitation if product is found toxic, then even IC 50 can be indicated by Log/Semilog method.	