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| **HOW TO GUIDE** |
| **Elemental analysis - Solid samples** |
| **Submission date**

|  |  |
| --- | --- |
| **Monday** | **Friday** |
| 10:00 - 11:00  |

* Both request form (via email as a word document to alab.chemeng@uct.ac.za) and samples should be submitted on:

|  |  |
| --- | --- |
| **Digestion method** | **Sample mass required (mg)** |
| Manual | 500 |
| Microwave | 200 |

**Minimum mass** **Which elements can be analysed on ICP-OES and MP-AES?**

|  |  |  |
| --- | --- | --- |
| **H** |  | **He** |
| **Li** | **Be** |  | **B** | **C** | **N** | **O** | **F** | **Ne** |
| **Na** | **Mg** | **Al** | **Si** | **P** | **S** | **Cl** | **Ar** |
| **K** | **Ca** | **Sc** | **Ti** | **V** | **Cr** | **Mn** | **Fe** | **Co** | **Ni** | **Cu** | **Zn** | **Ga** | **Ge** | **As** | **Se** | **Br** | **Kr** |
| **Rb** | **Sr** | **Y** | **Zr** | **Nb** | **Mo** | **Tc** | **Ru** | **Rh** | **Pd** | **Ag** | **Cd** | **In** | **Sn** | **Sb** | **Te** | **I** | **Xe** |
| **Cs** | **Ba** | **La** | **Hf** | **Ta** | **W** | **Re** | **Os** | **Ir** | **Pt** | **Au** | **Hg** | **Tl** | **Pb** | **Bi** | **Po** | **At** | **Rn** |
| **Fr** | **Ra** | **Ac** | **Rf** | **Db** | **Sg** | **Bh** | **Hs** | **Mt** | **Ds** | **Rg** | **Cn** | **Uut** | **Fl** | **Uup** | **Lv** | **Uus** | **Uuo** |
|  | **Ce** | **Pr** | **Nd** | **Pm** | **Sm** | **Eu** | **Gd** | **Tb** | **Dy** | **Ho** | **Er** | **Tm** | **Yb** | **Lu** |  |
| **Th** | **Pa** | **U** | **Np** | **Pu** | **Am** | **Cm** | **Bk** | **Cf** | **Es** | **Fm** | **Md** | **No** | **Lr** |
|

**Estimated turnaround time for analysis**

|  |  |  |
| --- | --- | --- |
| **Turnaround option** | **Estimated time** | **Max number per week** |
| Normal1 | 3-5 weeks | N/A |
| Fast track2 | 8–12 working days | N/A |
| UGP3 | Highest priority | - |

1. Normal turnaround is often shorter than 3-5weeks. It accounts for a queue and/or method development for new samples. A large batch of samples submitted might take longer than 3-5 weeks.
2. Recommended for samples that we have analysed previously. A large batch of samples submitted might take longer than 8-12 working days.
3. Reserved for 4th year UCT undergraduate students. Undergrad project samples given highest priority over other samples.
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|  |
| --- |
| **SECTION A: TO BE COMPLETED BY CUSTOMER** |
| **Customer Details** |
| Name:  |
| Date sample/s+ request form submitted |
| Research group/Department: | Cost Centre/ Fund number: |
| E-mail: | Cell No: |
| Supervisor name: |

|  |
| --- |
| **Instrument/Type of Analysis** |
|  | **Type of samples** | **Recommended no. of elements** | **Tick to indicate *🗹*** |
| ICP-OES | Catalyst, Coal, Soil, Plant (etc) | $\geqq $3 |  |
| MP-AES | Catalyst, Coal, Soil, Plant (etc) | 1-5 |  |
| Turnaround time: **(*Tick to indicate 🗹*)**Normal Fast Track UGP  | Supervisor approval for Fast Track: Yes **(*See page 1 for more details*)** |

|  |
| --- |
| **Sample Information** |
| Number of solid samples: | Number of elements to be analyzed: |
| Type of sample - ***Tick to indicate🗹***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Coal | Mineral ore | Catalyst | Plant material | Soil | Sediment |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Does your sample contain? | Si | Ti | Al | Ce | Other |
|  |  |  |  |  |
| If other, please specify: |

If other, please specify: | Please specify which elements to be analyzed:

|  |  |
| --- | --- |
| Elements | Concentration (wt%) |
|  |  |
|  |  |
|  |  |

What other elements are in your samples? (**Not for analysis)** |
|

|  |  |  |
| --- | --- | --- |
| Does it contain organic material? | Yes | No |
|  |  |
| If other, please specify: |

 | How do you wish for us to report your results **(*Tick to indicate*** *🗹***)**?

|  |  |
| --- | --- |
| wt% | µg/g (ppm) |
|  |  |

 |
| **Does your sample contain anything else?** |
| **Have you declared all information about your sample? Yes or No**  |

|  |
| --- |
| **SECTION B: TO BE COMPLETED BY ANALYST/S** |
| **Start of Analysis** |
| Analysis request number: **RN2024-S** |
| Request number assigned by: |
| Analyst/s assigned to task: |
| Date sample/s submitted: | Date digestion completed: |
| Date request form submitted: | Date analysis started:  |
| Date request number sent:  | Date analysis completed:  |
| Date digestion started: | Date report/ results sent:  |

|  |
| --- |
| **Notes on Sample Preparation and Analysis** |
| **Digestion Method + sample preparation:****Renaming of labels:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1:1Co,Mn125 | 1254 KMNo4 |  |  |  |  |  |  |  |  |
| a | b |  |  |  |  |  |  |  |  |

**Masses of samples:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (mg) | a | b |  |  |  |  |  |
| 52 |  |  |  |  |  |  |

**Microwave digestion:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample Name | Digestion method | Acid mixture | Temp (oC) | Ramp time (min) | Hold time (min) | Digested completely? ✔(yes) /x (no) |
| A,b,c,d,e | Ag |  |  |  |  |  |
| F,G,H and I | Pt |  |  |  |  |  |
|  |  |  |  |  |  |  |

If x, please specify:

|  |  |  |
| --- | --- | --- |
| 25 ml | 50 ml | Other (ml) |
|  |  |  |

**Final volume made up:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2% HNO3 | 5% HCl | 10% HCl | Water | Other |
|  |  |  |  |  |

**Acid use to make up digestion:** If other, please specify:  |

|  |
| --- |
| *NOTES ON SAMPLE PREPARATION AND ANALYSIS – To be completed by analyst/s* |
| **Calibration range and standards used:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | Wavelength (nm) | Calibration range(mg/L) | R2 | Check standard(mg/L) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**File Name/s:**

|  |  |
| --- | --- |
| Sample Name | Dilution Factor |
|  | Al | Mg | Na |
|  |  |  |  |

**Sample preparation**:

|  |  |
| --- | --- |
| Yes | No |
|  |  |

Minimum dilution **(*Tick to indicate*** *🗹***):** If yes, what is the minimum dilution factor?

|  |  |  |  |
| --- | --- | --- | --- |
| TDS | Precipitation | Volume | Other |
|  |  |  |  |

Reason: If other, please specify.

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Wavelength (nm) | interferant | Wavelength(nm) |
|  |  |  |  |

**Interferences:** Paste image: **Sample difficulties/ observations:** |