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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](mailto: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: | |

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| **Instrument/Type of Analysis** | | | |
|  | **Type of samples** | **Recommended no. of elements** | **Tick to indicate *🗹*** |
| ICP-OES | Catalyst, Coal, Soil, Plant (etc) | 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*)** | |

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| **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** | |

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| **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: |

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| **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: |

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| *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:** |