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| **HOW TO GUIDE** |
| **Particle characterization - Chemisorption** |
| **Submission dates*** Both request form (via email as a word document to alab.chemeng@uct.ac.za) and samples should be submitted on:

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

**Minimum mass*** A minimum sample mass of 0.5 g is required.

**Type of samples*** Only calcined samples can be analysed by chemisorption. If it is a spent catalyst or sample, it should be treated to remove organics/contaminants on the surface.

**Degas temperature and hold time*** The sample will be degassed to remove contaminants from the surface and pores, i.e., it will be heated in a flow of nitrogen for a few hours. For example:

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| **Type of sample** | **Degas conditions** |
| Zeolites | 350 °C, 3 hours |
| Other catalysts | 1. , 3 hours
 |

**Metal composition*** Specify metal composition. For example:

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| --- | --- |
| **Metal** | **Concentration (wt%)** |
| Pt | 10 |
| Ca, Mg, K, Al | 0-24 |

**Estimated turnaround time for analysis**

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| --- | --- | --- |
| **Turnaround option** | **Estimated time** | **Max number per week** |
| Normal1 | 1-2 weeks | N/A |
| Fast track2 | 5-7 working days | 2 samples |
| ASAP3 | * 1. working days
 | 1 sample |
| UGP4 | Highest priority | - |

1. Normal turnaround is often shorter than 1 – 2 weeks. It accounts for a queue and/or method development for new samples.
2. Recommended for samples that we have analysed previously. A large batch of samples submitted might take longer than 5 – 7 working days.
3. ASAP turnaround is only recommended for similar samples that we have analysed previously. We should have an established working method already.
4. 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** |
| ASAP 2020 - Metallic surface area, metal dispersion and crystallite size analysis ***(Tick to indicateþ)*** |
| H2-chemisorption | O2-chemisorption | CO-chemisorption |
| Turnaround time: (***Tick to indicateþ)***Normal Fast track ASAP UGP | Supervisor approval for Fast track or ASAP: Yes ***(See page 1 for more details)***  |

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| **Sample Information**  |
| Number of samples: |
| Number of metals in sample:Please specify:

|  |  |
| --- | --- |
| Metal | Concentration (wt%) |
|  |  |
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 | Method for analysis:

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| --- | --- | --- | --- | --- |
| Task | Gas | Temp. (°C) | Rate1 (°C/min) | Hold time |
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1. Minimum ramp rate is 1 °C/min
 |
| Degas temperature and hold time - ***Tick to indicateþ***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 60 °C, overnight | 120 °C, overnight | 200 °C, 3 hours | 350 °C, 3 hours | If other, specify |
|  |  |  |  |  |

Are your samples stable at this degas temperature?**Yes or No** | Does your sample contain anything else (for e.g., organic species, acid pre-treatment, etc.)? Please specify: |
| **Have you declared all information about your sample?** **Yes or No** |

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

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| **Notes on Sample Preparation and Analysis**  |
| **Final degas conditions - *Tick to indicateþ***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **60 °C, overnight** | **120 °C, overnight** | **200 °C, 3 hours** | **350 °C, 3 hours** | **If other, specify** |
|  |  |  |  |  |

**File Name/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **ANC file** | **SMP file** | **Analysis successful?** |
|  |  |  |  |
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**Analysis conditions:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task** | **Gas** | **Temp. (°C)** | **Rate (°C/min)** | **Hold time** |
|  |  |  |  |  |
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**Observations/opinions:**Measured sample mass (g):

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| --- | --- | --- | --- |
| **Sample** | **Pressure range (mmHg)** | **Metallic area (m2/g)** | **Metal dispersion (%)** |
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