

# Certificate of Analysis

**Caffeine OAS**  
**Cat No B2030 & B2104 - Certificate No 239704**

## General

This Organic Analytical Standard (OAS) consists of a purified and homogeneous batch of Caffeine for use as a routine working microanalytical standard for the determination of Carbon, Hydrogen, Nitrogen and Oxygen.

## Certified Values and Uncertainty

The uncertainty in the certified value is expressed as expanded uncertainty, U, at 95% confidence and is calculated in accordance with ISO/IEC17025 according to GUM (Guidelines to Uncertainty in Measurement). Confidence limits include those due to sampling variation, weighing, calibration and measurement errors. The certified values are based upon the results of 20 to 29 determinations.

The certified values for Carbon, Hydrogen and Nitrogen were determined by elemental analyser calibrated to Acetanilide 141d from National Institute of Standards and Technology (NIST), Maryland, USA.

The certified values for Oxygen were determined by elemental analyser calibrated to Acetanilide 141d from National Institute of Standards and Technology (NIST), Maryland, USA.

| <i>Element</i>  | <i>Certified Value</i><br>(% w/w) | <i>Uncertainty</i><br>(+/- %) | <i>Theoretical</i><br>(%w/w) |
|-----------------|-----------------------------------|-------------------------------|------------------------------|
| <b>Carbon</b>   | <b>49.48</b>                      | <b>0.20</b>                   | <b>49.48</b>                 |
| <b>Hydrogen</b> | <b>5.16</b>                       | <b>0.08</b>                   | <b>5.19</b>                  |
| <b>Nitrogen</b> | <b>28.83</b>                      | <b>0.20</b>                   | <b>28.85</b>                 |
| <b>Oxygen</b>   | <b>16.47</b>                      | <b>0.19</b>                   | <b>16.48</b>                 |

## Expiration of Certification

The certification of this OAS is valid until 03-May-20 within the measurement uncertainties specified.

## Storage and Use

This OAS should be stored at temperatures between 20°C to 25°C and should be kept tightly sealed away from light and moisture. It is non-hygroscopic under normal conditions and can be used without preliminary drying.

## Certification Information

The technical aspects involved in the preparation, certification and issuance of this (In)Organic Analytical Standard (IAS/OAS) were carried out at Elemental Microanalysis Limited, Okehampton, Devon, EX20 1UB, UK, Tel +44 1837 54446, Fax +44 1837 54544, Email [info@microanalysis.co.uk](mailto:info@microanalysis.co.uk).

for and on behalf of  
Elemental Microanalysis Limited

Jon Davies  
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