Rapid Ultra-trace analysis for MIB and Geosmin in Water

INTRODUCTION

Geosmin and 2-Methylisoborneol (MIB) are naturally occurring compounds associated with musty or earthy off-flavours in drinking water. These compounds are often tested in the Catchment Monitoring, Recycled Water and Drinking Water sectors. With increasing demand for faster analysis and lower detection limits, ALS is now able to offer NATA accredited and extremely rapid determination of these compounds at the low ng/L (ppt) levels.

MIB and Geosmin are naturally occurring terpene alcohols which can be produced by blue green algae (Cyanobacteria) and filamentous bacteria (Actinomycetes). Although these organic compounds are usually only present at ultra-trace levels, the human nose can detect Geosmin at concentrations as low a 5 parts per trillion or 0.000005 mg/L. For this reason Geosmin and/or MIB in drinking water can create considerable public concern particularly related to (foul smelling) drinking water.

In cases where drinking water supplies or potential drinking water sources include a high surface water component, the presence of Geosmin and/or MIB can often lead to episodes of distinctly unpleasant tasting/smelling water when released into the water supply. The problem is further compounded by the difficulty in removing these by conventional water treatment techniques (such as utilising activated carbon). As a result, the water industry often requires this incredibly low level analysis to be performed in a very short timeframe. In the past, the analysis of the compounds to the ppt level in any time less than 5 days has been extremely difficult and hence the need for a more rapid service.

METHOD INFORMATION

ALS METHOD CODE

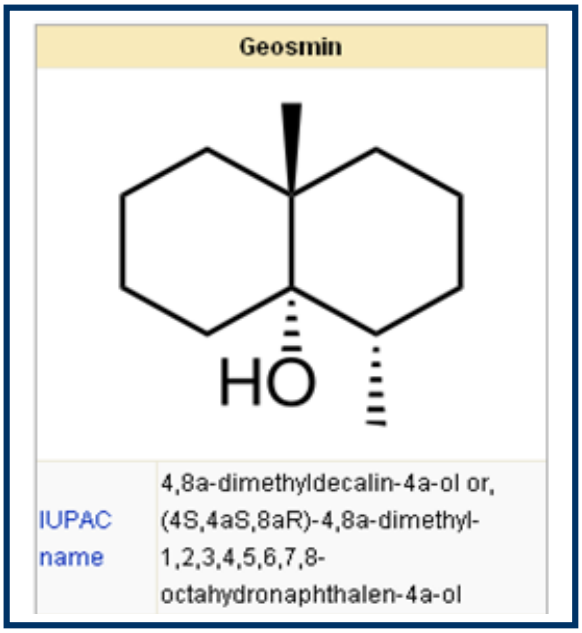
MIB/Geosmin: EP-115

LEVEL OF REPORTING

MIB (2-methyl-isoborneol): 1.0 ng/L or ppt (0.0010 µg/L)
Geosmin: 1.0 ng/L or ppt (0.0010 µg/L)

NEW DEVELOPMENTS AT ALS

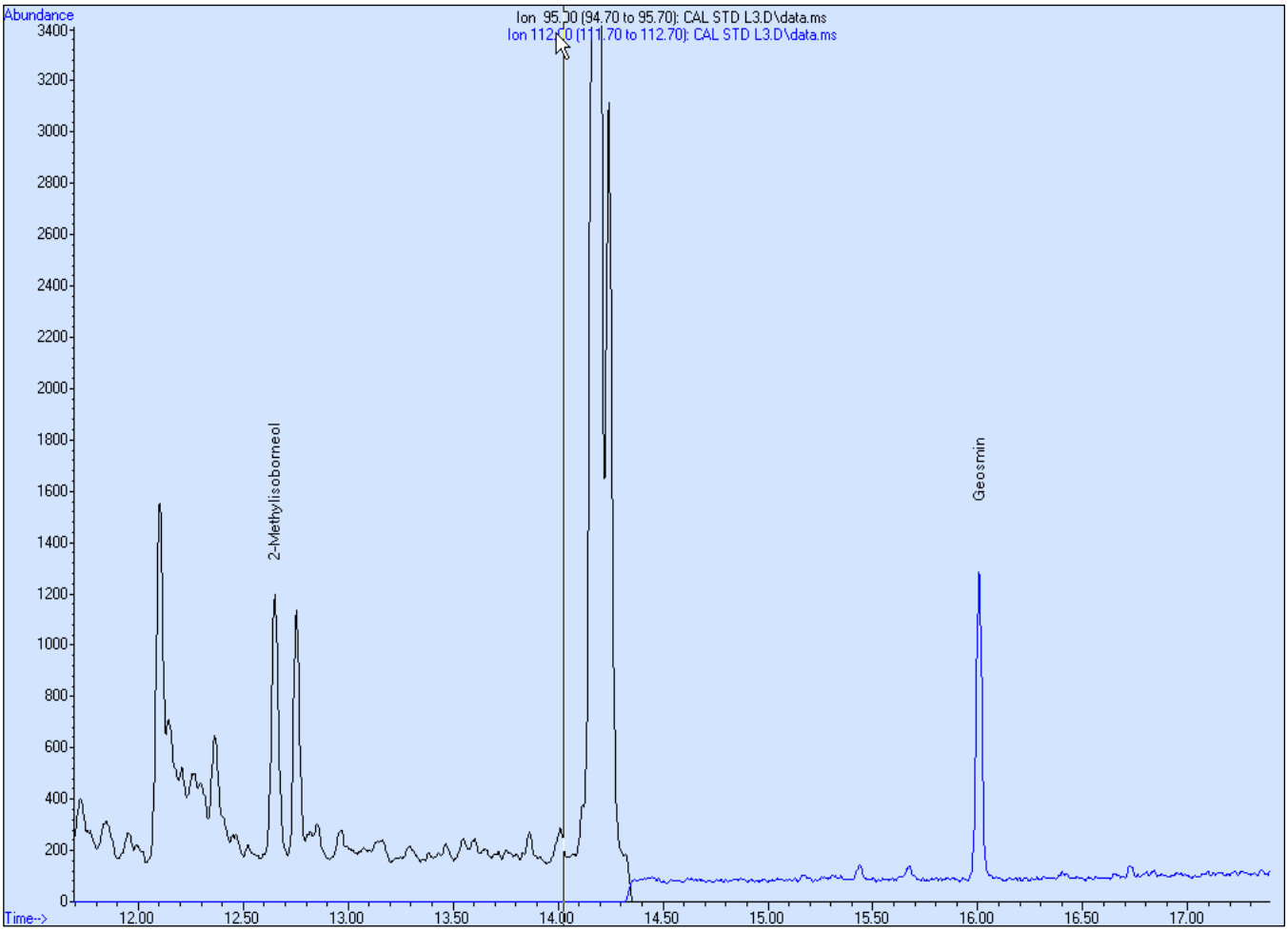
Following the release of this capability in **Sydney** in 2008, MIB/Geosmin testing is now also offered locally by ALS **Brisbane** and **Melbourne (Scoresby)** Laboratories under full NATA accreditation. This will further enhance ALS ability to rapidly respond to client needs and optimize service for this important aesthetic water quality parameter.



ANALYSIS BY GC/MS

The analysis of MIB and Geosmin is performed using specialised equipment including high sensitivity GC/MS. Peak confirmation uses established qualifier ions as per USEPA protocols. The analytical methodology adopted by ALS is extremely sensitive. The adjacent chromatogram shows the elution of both MIB and Geosmin at a concentration of 5.0 ppt (5.0 ng/L) in sample.

This NATA accredited methodology has demonstrated high degrees of precision and accuracy at incredibly low levels, as shown by the 1.0ng/L LOR



GENERAL SAMPLING REQUIREMENTS

A further advantage of the ALS methodology is that sample collection volume is minimised. Two unpreserved 40ml vials are sufficient for analysis. These vials should be submitted with zero headspace to ensure data quality is not compromised. Under no circumstances should samples be acidified. These un-preserved vials will also facilitate rapid shipment by air (from more remote regional sites) to allow timely reporting of results.

REFERENCES:

(1) *Geosmin*, http://en.wikipedia.org/wiki/Geosmin

(2) Juttner F, Watson F. B (2007), Biochemical and Ecological Control of Geosmin and 2-Methylisoborneol in Source Waters, *Applied and Environmental Microbiology, 73(14), pp 4935 - 4406*