



Request for Quotation

Development of Clumped Isotope CO₂ Micro Cryo-Purification Trap Design

Background

*Protium MS has strong ambition to accelerate its growth and for this reason is working with Sci-Tech Daresbury as a partner in the **Liverpool City Region – New Markets 2 Programme** which is part funded through the **European Regional Development Fund (ERDF)**. This programme will part fund the work requested below and hence accelerate the impact arising for Protium MS.*

About Protium MS

Protium MS is a small company dedicated to the design and production of bespoke scientific instrumentation. The company focuses on stable isotope mass spectrometry and associated sample preparation systems.

About the project

Protium has developed an instrument for the preparation of carbonate rocks for clumped isotope analysis. This is a new and innovative technique used for the characterisation of oil and gas reservoirs. The technique is also used to estimate paleo oceanic temperatures from carbonates precipitates. The accuracy of this technique is +/- 1°C.

The system developed by Protium is the only commercial unit available that provides continuous flow sample preparation. This enables the unit to process samples with high levels of contaminants that currently cannot be analysed by other methods.

Work required

The current system contains two Cryo-traps designed to capture and purify CO₂ liberated from carbonate rock samples via acid digestion. These traps were designed for large sample sizes of >= 3mg of pure calcium carbonate (CaCO₃). We wish to alter the design of these traps to enable small sample analysis (<=0.5mg of pure CaCO₃) and improve the ability of these traps to remove hydrocarbon contaminants.

Why this work?

The IBEX has performed well on standard large samples with only moderate levels of contamination. However, the market is now calling for the following improvements to the instrumentation.



1. Analysis of small samples ($\leq 0.5\text{mg}$ of CaCO_3).
2. Analysis of small samples containing high levels of hydrocarbon residues ($\leq 2500\text{ ppm}$)
3. Increased analytical precision.

These improvements will allow higher resolution characterisation of oil and gas fields enabling improved modelling and exploitation. This would increase demand within sector and provide a significant business opportunity

What is constraining growth of the company and why is this work needed.

We do not currently have the in house expertise do design the small volume traps required to supply current market requirements. This is constraining the growth of the company and the application of the technique to the oil and gas industries.

The work is required to meet the significant potential market demand and the allow Protium MS to rapidly increase its current growth rate.

Goal

The outcome from this work will be a Cryo-trap design capable of:

1. Sample preparation of small rock samples ($\leq 0.5\text{mg}$) for clumped isotope analysis.
2. The analysis of rock samples highly contaminated with hydrocarbons ($\leq 2500\text{ ppm}$).

Ambition

A successful outcome to this project would provide Protium MS with a sector-leading product. This would have two major impacts:

1. Increase sales within existing markets.
2. Open new markets and applications.
3. Enable application of IBEX for the characterisation of oil and gas reservoirs.

Specification for Quotation

What is the detail of the exact requirements that need to be delivered?

1. The traps should be made from silco steel
2. The volume of the traps should have a volume of 1ml or less.
3. The traps should have a temperature range from -197oC to $+300\text{oC}$.
4. It should be possible to set the traps to any temperature within this range to an accuracy of 1oC .
5. The optimum stationary phase for hydrocarbon removal should be identified (e.g. PoraPlotQ).



6. *All traps should be able to work under a continuous flow of helium at rates of 10 to 60 ml per minute.*
7. *The traps should not fractionate sample gas, this will be measured by Cap 47 values (≤ 0.05 per mil sd over 5 replicates of ZET). and the "49 parameter" (≤ 0.100).*

Deliverable Timescale

Work must be completed within 12 weeks from order

Indicative Budget

Quotes above £7,000 will not be considered

Evaluation Criteria

Quotations will be assessed and scored on the following criteria:

Quality/Technical Merit (50%)

Assessment of the technical and professional capability that the potential supplier has to demonstrate that it can deliver the requirement.

Delivery Timescale (20%)

Can the supplier meet the timescales/deadline?

Cost/Value for Money (30%)

Is the price good value for money?

Scoring Methodology

4 Excellent - Proposal meets and in some places exceeds the required standard.

3 Good - Proposal meets required standard.

2 Acceptable - Proposal meets the required standard in most respects, but is lacking or inconsistent in others.

1 Poor - Proposal falls short of expected standard.

0 Unacceptable - Completely or significantly fails to meet required standard or does not provide the relevant answer.

Proposal Format

Proposals should clearly demonstrate how they meet the requirement set out above.



European Union
European Regional
Development Fund



Deadline and Submission

Proposals are required by 10-7-17

Proposals must be forwarded by email to david.bell@protiumms.com

Date Published:

28-6-17

Response to questions arising from this RFQ:

All questions that are raised in regard to this RFQ and the relevant answers supplied will be published to all companies that have submitted quotations.

Date of Notification:

All applicants will be notified by email whether they are successful or not by 31-7-17