

# New laser research could improve oil exploration success

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CSIRO Petroleum and German-based research centre Laser Zentrum Hannover eV (LZH) are collaborating in a project that could save millions of dollars in oil exploration and introduce new Australian geochemical and petroleum analysis techniques to Europe. Researchers from the two organisations are six months into a three year project working to enhance the capabilities of the on-line laser micropyrolysis gas chromatography-mass spectrometry (LaPy-GC/MS) technique for quality control and geochemical analysis.

Laser micropyrolysis is a widely accepted and effective instrument for many applications such as geochemical analysis for the petroleum industry, tissue analysis in laser medicine, quality control in petrochemistry and laser-assisted production.

CSIRO Petroleum organic geochemist Dr Simon George, based in Sydney, said the project sought to combine the advantages of the similar techniques currently used in both laboratories for different purposes.

At LZH, laser micropyrolysis has been demonstrated as a tool for quality control in the automotive industry, polymer processing and woodworking industries.

CSIRO has mainly used its version of the technique for petroleum industry and geochemical applications, except for some forensic work on analysing paint chips, hairs and photocopier toner. The technique has considerable promise as a forensic tool because such samples are

typically very small and only limited data can be acquired from them.

"From the CSIRO's perspective, enhancing this technique will enable more accurate analysis of small amounts of organic matter in source rocks and reservoir rocks, such as organic particles, microfossils, solid bitumens and oil-bearing fluid inclusions," Dr George said.

"This will mean that the oil-source potential of different organic materials will be better understood, enabling better prediction of when source rocks generated.

"If single oil inclusion can be analysed, this will also mean that much more detailed oil-charge event histories will be able to be constructed, enabling better prediction of where to drill new oil wells.

"This collaboration means the CSIRO will benefit from much more rapid development and refinement of the method than would be otherwise possible. For both partner countries, the investigation will give impetus to new scientific projects and industrial cooperation."

LZH scientist Dr Stephan Barcikowski said that there were very few operational laser micropyrolysis systems in the world and efforts to refine the technique have been dispersed and isolated.

"This collaboration, between two of the most active labs in the World on laser micropyrolysis, will enable pooling of resources and ideas, mutual testing of concepts and much quicker advancement and development of the technique," Dr Barcikowski said. "One outcome of this project will be to give the LZH new access to the petroleum, geochemistry and petrochemistry market in Germany and Europe.

"The whole potential of this technique for other applications may also be achieved if we can combine the advantages of our systems and further

validate this analytical method.

A joint patent of the newly developed instrumentation and method will be considered.

Source: CSIRO Australia

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