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Research and innovation for industry

Partnership Carnot IPFEN Ressources Energétiques Institute - Vinci Technologies

Rock Eval® 7S : a geochemical analysis for oil exploration or soil study in just a couple of hours, with few milligrams of rock or soil.

Analysing carbon and sulphur compounds in rocks and soil is absolutely essential in geochemistry. Thanks to the partnership between Carnot IFPEN Ressources Energétiques Institute and Vinci Technologies, the Rock Eval 7S analyser® combines instrument, reference materials, calibration methodology and analytical software to deliver unprecedented results.

Supporting Innovation

Rock Eval® is based on thermal analysis technology invented by IFPEN. It is capable of analysing carbon compounds in rocks, soil or any organic compound in less than two hours. It is used by industrial firms, analytical and research labs for fossil fuel prospection (assessing the petroleum potential of sedimentary rocks), analysing soil that has been polluted by hydrocarbons or soil organic matter (key indicator of fertility and carbon storage capacity based around the notion of carbon sinks). The most recent version – the Rock Eval 7S analyser® – which has been marketed commercially since 2019, has an additional feature that analyses the sulphur content of samples and yields more reliable and more accurate results. The first results are available after about an hour of processing, whereas traditional analytical methods are more costly, take longer and require the use of solvents. Specific reference materials and technical calibration guidelines make it possible to calibrate very precisely for each type of application, supported by specific features in GEOWORKS® software.

The client needs

By providing high-tech firms with sensors and lab instruments, especially for analysing rocks and geofluids, Vinci Technologies has become a global leader in tech solutions in the oil and gas sector over the past 50 years with around 100 engineers working in France, India and the US. The Company invests 10% of its revenues in R&D. Its partnership with the Carnot IFPEN Ressources Energétiques Institute has enabled it to develop and market several hundred Rock Eval® models spanning different generations of the product, each one yielding better results and incorporating new features. With a view to consolidating its position as pioneer and staying ahead of the pack, Vinci Technologies and Carnot IFPEN Ressources Energétiques have been looking at new features for a new generation of this equipment. The challenge for this new Rock Eval 7S analyser® has been to quantify the sulphur content of petroleum, kerogen and rock, to distinguish between organic and inorganic sulphur compounds in rock, and to deliver enhanced results through more effective calibration (multi-point and specific to each application), underpinned by new hardware and software components.
By adding sulphur to the list of compounds analysed, the Rock Eval 7S analyser® paves the way for new applications such as assessing the potential for producing H_2 S and reducing the related risks or analysing soil composition over a wider area. These new features give the Rock Eval 7S analyser® a strong competitive edge.

Partnership

Carnot IFPEN Ressources Energétiques Institute is a big R&I stakeholder in the energy transition. It helps companies to develop competitive solutions in new energies and minimise climate-environment impacts and to make fossil fuels use more sustainable. Vinci Technologies has been working with Carnot IFPEN Ressources Energétiques since 1993. The Rock Eval 7S analyser® has been able to draw on 15 years of Carnot basic and applied research to develop new technological features and analytical methods – protected by four patents – and enhance the quality of its analyses. The SME has included five new reference materials which, coupled with a new calibration protocol, have enhanced the reliability of Rock Eval®. The company's technological developments have endowed the product with new electronics and system software, a brand new interface and specific features from GEOWORKS® geochemical analytical software. Thence, a product with a real competitive edge was unveiled at the 2019 annual conference of the American Association of Petroleum Geologists in Texas.
A number of instruments have already been sold. The Rock Eval® range contributes nearly 10% of Vinci Technologies' revenue and the company was recently able to hire two engineers. These results are a testimony to the value of a long-term "research" partnership for tackling the challenges of an SME working in the oil industry where regulations on sulphur are becoming increasingly stringent. Fresh studies should make it possible to add even more features to the Rock Eval 7S analyser® and consolidate the dominant position of these partners in geochemical analysis.

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