



## 0.1 CHEMINI : CHEmical MINIaturised analyser

### A new generation of *in situ* chemical analysers for marine applications

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The development of *in situ* analysers to make chemical measurements in marine environment seems nowadays essential to allow the chemical characterisation of habitats prevailing in hydrothermal vent ecosystems. *In situ* chemical analysis offers numerous advantages such as the limitation of the modification of the sample with an immediate analysis, the possibility to perform high frequency automated measurement giving an access to steep chemical gradients, the potential to do real-time survey and *in situ* calibration. *In situ* chemical analysis is made possible by the use of flow analysis. Several types of field analysers have already been developed in Ifremer during the 90's. It is the case of the deep sea version « Alchemist »<sup>[1]</sup> (certified for depths down to 6000 m), used for the determination of iron and sulphur in hydrothermal zones and also for the determination of subnanomolar concentrations of iron in coastal waters<sup>[2]</sup>.

“CHEMINI” constitutes the new generation of analysers developed by Ifremer within the department Technology of the Instrumental Systems for the measurement of sea water chemical parameters. The choice of elements composing this new generation was made according to several rules: reliability, analytical performances, miniaturization to easily implement CHEMINI on deep submersibles, consumption (energy and reagent), and costs.

The deep-sea version of CHEMINI allowing the *in situ* determination of iron<sup>[3]</sup> and sulphide<sup>[4]</sup> was developed during the EXOCET/D European project. The results of the first at sea trials of the analysers during the MoMARETO cruise, targeted on the study of hydrothermal ecosystems on the Mid Atlantic Ridge<sup>[5]</sup>, will be presented.

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[3] Sarradin, P-M., Le Bris, N., Le Gall, C., Rodier, P, *Talanta*, Volume 66 (2005), Issue 5, pp. 1131-1138.

[4] Sarradin, P-M., Le Bris, N., Birot D., Caprais J.C., *Analytical Communication*, 36 (1999), 157-160.

[5] Sarrazin, J., Sarradin, P.M. and the MoMARETO cruise participants, *InterRidge News*, (2006), V15, 24-33.

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