Hydrothermal Vents and Processes

EDITED BY

L. M. PARSON
Institute of Oceanographic Sciences, Wormley, UK

C. L. WALKER
University of Leeds, UK

D. R. DIXON
Plymouth Marine Laboratories, UK

1995
Published by
The Geological Society
London
Contents

PARSON, L. M. Introduction 1

GERMAN, C. R., BAKER, E. T. & KLINKHAMMER, G. Regional setting of hydrothermal activity 3

KRASNOV, S. G., POROSHINA, I. M. & CHERKASHEV, G. A. Geological setting of high-temperature hydrothermal activity and massive sulphide formation on fast- and slow-spreading ridges 17

MURTON, B. J., VAN DOVER, C. & SOUTHWARD, E. Geological setting and ecology of the Broken Spur hydrothermal vent field: 29°10′N on the Mid-Atlantic Ridge 33


BAKER, E. T. Characteristics of hydrothermal discharge following a magmatic intrusion 65


PALMER, M. R., LUDFORD, E. M., GERMAN, C. R. & LILLEY, M. D. Dissolved methane and hydrogen in the Steinahöll hydrothermal plume, 63°N Reykjanes Ridge 111

MILLS, R. A. Hydrothermal deposits and metalliferous sediments from TAG, 26°N Mid-Atlantic Ridge 121

STUART, F. M., HARROP, P. J., KNOTT, R., FALLICK, A. E., TURNER, G., FOQUET, Y. & RICKARD, D. Noble gas isotopes in 25 000 years of hydrothermal fluids from 13°N on the East Pacific Rise 133

DICKSON, P., SCHULTZ, A. & WOODS, A. Preliminary modelling of hydrothermal circulation within mid-ocean ridge sulphide structures 145

PASCOE, A. R. & CANN, J. R. Modelling diffuse hydrothermal flow in black smoker vent fields 159

DUCKWORTH, R. C., KNOTT, R., FALLICK, A. E., RICKARD, D., MURTON, B. J. & VAN DOVER, C. Mineralogy and sulphur isotope geochemistry of the Broken Spur sulphides, 29°N Mid-Atlantic Ridge 175

SCOTT, S. D. & BINNS, R. A. Hydrothermal processes and contrasting styles of mineralization in the western Woodlark and eastern Manus basins of the western Pacific 191

KNOTT, R., FALLICK, A. E., RICKARD, D. & BÄCKER, H. Mineralogy and sulphur isotope characteristics of a massive sulphide boulder, Galapagos Rift, 85°55′W 207

CHERKASHEV, G. A. Hydrothermal input into sediments of the Mid-Atlantic Ridge 223

HODKINSON, R. A. & CRONAN, D. S. Hydrothermal sedimentation at ODP Sites 834 and 835 in relation to crustal evolution of the Lau Backarc Basin 231
SUDARIKOV, S. M., DAVYDOV, M. P., BAZELYAN, V. L. & TARASOV, V. G. Distribution and transformation of Fe and Mn in hydrothermal plumes and sediments and the potential function of microbiocenoses 249

VAN DOVER, C. L. Ecology of Mid-Atlantic Ridge hydrothermal vents 257

SHILLITO, B., LECHAIRE, J.-P., GOFFINET, G. & GAILL, F. Composition and morphogenesis of the tubes of vestimentiferan worms 295

DANDO, P. R., HUGHES, J. A. & THIERRMANN, F. Preliminary observations on biological communities at shallow hydrothermal vents in the Aegean Sea 303

SUDARIKOV, S. M. & GALKIN, S. V. Geochemistry of the Snake Pit vent field and its implications for vent and non-vent fauna 319

RIELEY, G., VAN DOVER, C. L., HEDRICK, D. B., WHITE, D. C. & EGLINTON, G. Lipid characteristics of hydrothermal vent organisms from 9°N, East Pacific Rise 329


COWAN, D. A. Hyperthermophilic enzymes: biochemistry and biotechnology 351

GERMAN, C. R. & ANGEL, M. V. Hydrothermal fluxes of metals to the oceans: a comparison with anthropogenic discharge 365

SPEER, K. G. & HELFRICH, K. R. Hydrothermal plumes a review of flow and fluxes 373

RUDNICKI, M. D. Particle formation, fallout and cycling within the buoyant and non-buoyant plume above the TAG vent field 387

Index 397