

THE CANADIAN MINERALOGIST

SEAFLOOR HYDROTHERMAL MINERALIZATION

containing invited papers and proceedings of a conference
convened by the Mineral Exploration Research Institute
in Montreal, February 5–6, 1987

PREFACE

Few phenomena have had as major an impact on the field of economic geology as the discovery of active seafloor hydrothermal systems. The study of these natural laboratories over the past decade has led to a substantial refinement of our models of ore-forming processes, particularly as applied to ancient volcanogenic massive sulfide analogs.

This special volume of *The Canadian Mineralogist* is an outgrowth of a two-day international conference on seafloor hydrothermal systems which was held at McGill University on February 5 and 6, 1987. Papers were invited relating to hydrothermal processes at a variety of mineralized oceanic rifts, including experimental and theoretical investigations. The conference was organized by the Mineral Exploration Research Institute (IREM-MERI), which is a university - industry research consortium composed of Ecole Polytechnique de Montréal, McGill University, and the Université de Montréal.

This volume attempts to provide an updated and hopefully representative coverage of seafloor metallogenic studies. An overview of seafloor hydrothermal deposits is provided by the paper by Rona. Several articles in the volume examine the growth of sulfide chimneys and mounds from a variety of mineralogical, petrological and fluid-evolution perspectives (the ARGO-RISE Group, Graham *et al.*, Bluth & Ohmoto, Marchig *et al.*, Peter & Scott, Paradis *et al.*, and Juniper & Fouquet). Also included are documentations of recent seafloor stockwork-type alteration and mineralization (Embley *et al.*, Kawahata & Shikazono), of the 'unexpected' vent fields on the Mid-Atlantic Ridge (Thompson *et al.*), of unusually radioactive sulfide chimneys (Grasty *et al.*), and of gold enrichment in recent seafloor sulfides (Hannington & Scott).

The products of hydrothermal activity associated with the important but hitherto little-described class of deposits found in sediment-buried oceanic rifts are the subject of six papers (Peter & Scott, Koski *et al.*, Goodfellow & Blaise, Gieskes *et al.*, Simoneit, and Barrett *et al.*). Mineralization within the unusual brine pools of the Red Sea is discussed by Ramboz *et al.*, Cole, and Zierenberg & Shanks. The character of metalliferous sediments away from active vents is the subject of papers by Herzig & Plüger, Barrett *et al.*, and Lalou *et al.* Experimental and computational models for the metasomatic and fluid mixing phenomena involved in active seafloor mineralization are also examined (Janecky & Shanks, Seyfried *et al.*). Many of the papers contain information or models that should be of relevance to the massive sulfide exploration community.

The organizers of the IREM-MERI seafloor conference and of this special volume gratefully acknowledge the Natural Sciences and Engineering Research Council of Canada, the Geological Association of Canada Robinson Fund, and the Geological Survey of Canada, for their financial support. We thank Mr. R. Savoie, Minister of State for Mines of the Province of Québec, for supporting and opening the conference.

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