

## Editorial

# Foreword to the thematic set on ‘Mineral deposits and ore-forming processes in spatial, temporal and geodynamic context (a special issue in honor of Professor Zdeněk Pouba)’

The need of human society for mineral resources and the quest for origin of their anomalous accumulations have been stimuli of geological research since its early days. Our knowledge of ore deposits has rapidly accelerated due to ever-growing exploration for non-traditional and high-tech materials to satisfy current technological advances. At the same time, scientific understanding of ore-forming processes has dramatically benefited from expansion and application of novel microanalytical, experimental and computational techniques. This special issue presents recent scientific advances and emerging issues in these fields of economic geology.

We are pleased to dedicate this thematic set to honor the 90<sup>th</sup> birthday of the late Zdeněk Pouba (1922–2011), professor emeritus of economic geology at the Charles University and a prominent geologist. Zdeněk Pouba was born in Zvolen (Slovakia), entered the Charles University in Prague in 1945 and remained associated with his *alma mater* for more than sixty years. He held a research fellowship at the Carnegie Institution of Washington, was one of the founding members of the International Association on Genesis of Ore Deposits (IAGOD) and maintained strong involvement in international research programs with leading scientists. His research activities ranged from regional and structural geology of ore and non-metallic resources to relationships between volcanic and hydrothermal activity and its microbiota – his last research projects.

The present issue covers a wide range of topics ranging from isotopic and geochemical to mineralogical and ore-deposit case studies, while highlighting diversity of analytical techniques and scientific approaches. In the first contribution, *Pašava et al.* identify principal carriers of Pt-group elements (PGE) in metal-rich black shales, using the Zunyi region in the Guizhou province of south China as model example. The anomalously high concentrations of PGE (~ 1 ppm) are hosted in pyrite and nickel sulfides such as millerite and gersdorffite, but PGE compounds are absent. The second paper by *Kapsiotis* addresses the origin of mantle peridotites in the Vourinos ophiolite complex, Greece, using morphological and compositional variations of chromian spinel. The data indicate coeval formation of chromitites and dunites followed by percolation of residual boninitic melts in a fore-arc setting. The ore-forming potential of ultramafic intrusions in a fossil island arc is further discussed in two studies of *Han et al.* devoted to Cu–Ni–Co sulfide deposit at Hulu and surrounding mafic–ultramafic complexes in the Central Asian orogenic belt in Eastern Tianshan. The U–Pb zircon dating in combination with Lu–Hf and Re–Os isotopic and whole-rock geochemical analyses reveal derivation of parental magma from a depleted asthenospheric mantle followed by contamination by lower crustal material during Permian plate convergence. Since an arc-related setting is unexpected for this mineralization style, this finding opens new prospects for base-metal mineral exploration. The subsequent contribution by *Kohút et al.* uses the Re–Os age dating to unravel the multistage history of peculiar U–Mo mineralization at Kurišková in the Western Carpathians (Slovakia). The primary vein mineralization formed by precipitation from magmatic–hydrothermal fluids during Late Permian, but was remobilized by Triassic–Jurassic meteoric fluids to produce a shear zone-related stockwork. This study underpins superposition of volcanic and hydrothermal activity and near-surface fluid flow to produce significant U–Mo enrichment within a volcanoclastic sequence. The issue closes with a case study by *Veľbil and Zachariáš* focused on mercury mineralization at Horní Luby in the Saxothuringian Zone of the Bohemian Massif (Czech Republic). Detailed investigation of fluid-inclusion populations revealed the presence of H<sub>2</sub>O–CO<sub>2</sub> mixtures during metamorphic quartz veining and secretion, with repeated fluid unmixing and precipitation of cinnabar, pyrite and siderite down to 150 °C. The cinnabar composition as well as minute occurrences of mercurian sphalerite indicate a more complex precursor of the mineralization, which has been remobilized during vaning stages of the Variscan orogeny.

The special issue provides a selection of diverse mineralization styles occurring in Phanerozoic orogens of Europe and Asia. We hope that the breadth and multitude of approaches presented in the following papers will stimulate new studies and applications of state-of-the-art analytical techniques to further enhance our understanding of ore-forming processes. Finally, we wish to thank all authors contributing to this special issue in honor of Professor Zdeněk Pouba and express our sincere gratitude to reviewers, who frequently supplied high-quality reviews and constructive comments on a tight schedule.

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[Guest Editors]