

## REFERENCES

- Adams, S.F., 1920, A microscopic study of vein quartz. *Economic Geology* 15 (8), p. 623-664.
- Arribas, A., Jr., 1995, Characteristics of high-sulfidation epithermal deposits, and their relation to magmatic fluid, in Thompson, J.F.H., eds., *Magma, fluids and ore deposits: Mineralogical Association of Canada Short course Series*, v. 23, p. 419-454.
- Arribas, A., Jr., Cunningham, C.G., Rytuba, J.J., Rye, R.O., Kelly, W.C., Podwysocki, M.H., McKee, E.H., and Tosdal, R.M., 1995, *Geology, geochronology, fluid inclusions, and isotope geochemistry of the Rodalquilar gold-alunite deposit, Spain: Economic geology*, v. 90, p. 795-822.
- Aung.T.T., 1988, Geothermal resources of Burma. *Geothermics*, vol. 17, No 2/3, London, pp. 429-437.
- Aung.H.H., 2017, *The volcanic occurrences in relation to tectonics, Central Myanmar Basin*. Hyderabad, India, 308pp.
- Bannert, D., and Hemcke, D., 1981, The evolution of the Asian plate in Burma. *Geol Rdsch* 70, Stuttgart.
- Barber C., 1936, The Tertiary igneous rocks of the Pakokku district and Salingyi Township of the lower Chindwin districts, Burma, with special reference to the determination of the feldspars by Fedoroff method. *Mem Geol Surv India*, 68 (part 2), p 121-292.
- Barber, A.J., Zaw.K., and Crow, M.J., 2017, The pre-Cenozoic tectonic evolution of Myanmar. *Resources Geology and Tectonics*. Geological Society, London, *Memoirs*, 48, p 687–712.
- Barley, M.E., Zaw.K., Pickard, A.L., Rak, P., Doyle, M.G., 2003, Jurassic to Miocene magmatism and metamorphism in the Mogoke Metamorphic Belt: implications for the India-Eurasia collision in Myanmar. *American Geophysical Union. Tectonics*. vol. 22, No. 3, 1019. P. 1-14.
- Bender, F., 1983, *Geology of Burma*. Gebruder Borntraeger, Berlin, 292pp.
- Bernales, S.T., 1996, *Alteration zoning in Monywa High-Sulfidation copper mineral deposits, Myanmar*. p. 1-20.
- Bodnar, R.J., Reynolds, T.J., and Kuehn, C.A., 1985, Fluid inclusion systematic in epithermal systems: *Reviews in Economic Geology*, v. 2, p. 73–97.

- Bodnar, R.J., 1993, Revised equation and table for determining the freezing point depression of H<sub>2</sub>O-NaCl solutions. *Geochimica et Cosmochimica Acta*, 57, p. 683-684.
- Bodnar, R.J., 2003b, Interpretation of data from aqueous-electrolyte fluid inclusions. In I. Samson, A. Anderson, & D. Marshall, eds. *Fluid Inclusions: Analysis and Interpretation. Mineral. Assoc. Can., Short Course Ser.* 32, p. 81-100.
- Bons, P.D., 2001, The formation of large quartz veins by rapid ascent of fluids in mobile hydrofractures. *Tectonophysics* 336:1–17.
- Boynton, W.V., 1984, Cosmochemistry of the Rare Earth Elements: Meteorite Studies. In: Henderson, P., Ed., *Developments in Geochemistry*, Elsevier Sci. Publ. Co., Amsterdam, 63-114.
- Buchanan, I.J., 1981, Precious metal deposits associated with volcanic environments in the Southwest. *Arizona Geological Society Digest* 14, p. 237-262.
- Burnham, C.W., 1979, Chapter 3: magmas and hydrothermal fluids. In: Barnes, H.L. (Ed.), *Geochemistry of Hydrothermal Ore Deposits*, 2<sup>nd</sup> edition. John Wiley & Sons Inc, New York, pp. 71 –136.
- Chhibber, H. L., 1934, *Geology of Burma*: Macmillan, 538p.
- Conrad, M.E., Petersen, U., and O'Neil, J.R., 1992, Evolution of an Au-Ag producing hydrothermal system: The Tayoltita mine, Durango, Mexico: *Economic Geology*, 87, p. 1451 -1474.
- Collins W.J., Beams S.D, White A.J.R., Chappel BW. 1982, Nature and origin of A-type granites with particular reference to southeastern Australia. *Contributions to Mineralogy and petrology.* 80, 180-200.
- Cooke, D.R., and Bloom, M.S., 1990, Epithermal and subjacent porphyry mineralization, Acupan, Baguio district, Philippines: A fluid-inclusion and paragenetic study, in Hedenquist, J., White, N.C., and Siddeley, G., eds., *Epithermal Gold Mineralization of the Circum-Pacific; Geology, Geochemistry, Origin and Exploration*, II: *Journal of Geochemical Exploration*, v. 35, p. 297-340.
- Cooke, D.R., and Deyell, C.L., 2003, Descriptive names for epithermal deposits: Their implications for genetic classifications and inferring ore fluid chemistry, In Eliopoulos, D. *et al.*, *Mineral exploration and sustainable development*: Rotterdam, Mill press, v. 1, p. 457–460.

- Cooke, D.R., and Simmons, S.F., 2000, Characteristics and genesis of epithermal gold deposit. *Reviews in Economic Geology*, v.13, p.221 -244.
- Corbett, G., 2002, Epithermal gold for explorationists. *AIG J. Appl. Geosci. Pract.Res. Aust.* 26. Corbett, G.J., Leach, T.M., 1998, Southwest Pacific Rim gold-copper systems: structure, alteration and mineralization. *Soc. Economic Geology. Spec. Publ.* 6, 236 pp.
- Corbett, G.J., Leach, T.M., 1998, Southwest Pacific Rim Gold –Copper Systems: Structure, Alteration, and Mineralization. *Society of Economic Geologists, Inc.*
- Curry, J.R., Moore, D.G., Lawver, L.A., Emmel, F.J., Raitt, R.W., Henry, M. & Kieckhefer, R., 1979, Tectonics of the Andaman Sea and Burma. In: Watkins, J.S., Montadert, L. & Dickerson, P.W. (eds) *Geological and Geophysical Investigations of Continental Margins. AAPG, Memoirs*, 29, 189–198.
- Czamanske, G. K., 1974, The FeS content of sphalerite along the chalcopyrite-pyrite-bornite sulfur fugacity buffer. *Econ. Geol.*, 69, 1328–1334
- Defant, M.J., and Drummond, M.S., 1990, Derivation of Some Modern Arc Magmas by Melting of Young Subducted Lithosphere. *Nature*, 347, 662-665.
- Dong, G., Morrison, G., Jaireth, S., 1995, Quartz textures in epithermal veins, Queensland; classification, origin and implication. *Economic Geology* 90 (6), p. 1841-1856.
- Einaudi, M.T., Hedenquist, J.W., and Inan, E., 2003, Sulfidation state of fluids in active and extinct hydrothermal systems: Transitions from porphyry to epithermal environments: *Society of Economic Geologists Special Publication* 10, p. 285–314.
- Faure, K., Matsuhisa, Y., Metsugi, H., Mizota, C., and Hayashi, S., 2002, The Hishikari Au–Ag epithermal deposit, Japan: oxygen and hydrogen isotope evidence in determining the source of paleo-hydrothermal fluids. *Economic Geology*, 97, 481 –498.
- Fournier, R.O., 1985a, The behavior of silica in hydrothermal solutions. *Reviews in Economic Geology* v.2, p. 45-61.
- Fournier, R.O., 1985b, The behavior of silica in hydrothermal solutions: in Berger, B. R. & Bethke, P.M. (eds) *Geology and Geochemistry of epithermal system*, *Reviews in Economic Geology* v.2, p. 45-51.

- Gardiner, N.J., Searle, M.P., and Robb, L.J., 2015, Neo-Tethyan magmatism and metallogeny in Myanmar – an Andean Analogue? *Asian Journal of Earth Sciences*, 106, 197–215.
- Gemmell, J.B., 2004, Low and intermediate-sulfidation epithermal deposits. In: In: Cooke, D.R., Deyell, C.L., Pongratz, J. (Eds.), 24 Carat Gold Workshop 5. Centre for Ore Dep. Res. Spec. Pub., pp. 57 –63.
- Goossen, P.J., 1978, The metallogenic provinces of Burma: their definitions, geological relationships and extension into China, India and Thailand. Third Regional conf. on Geology and Mineral References of Southeast Asia, Bangkok. P.432-492.
- G.I.A.C. Project, 2000, The tectonics of Myanmar. Final report. Geodynamic of India-Asia Collision Project report.
- Haas, J.L.Jr., 1971, “The effect of salinity on the maximum thermal gradient of a hydrothermal system at hydrostatic pressure”, *Economic Geology*. 66, 940–946.
- Hajalilou, B., 2008, *Geo-Thermometry of Fluid Inclusions*. Payam-e-Nour Publications, 309. (In Persian).
- Hall, D. L., Sterner S. M., and Bodnar R. J., 1988, Freezing point depression of NaCl-KCl-H<sub>2</sub>O solutions. *Economic Geology*, 83, 197–202.
- Hannington, M.D., de Ronde, C.E.J., and Petersen, S., 2005, Sea-floor tectonics and submarine hydrothermal systems: in Hedenquist, J.W., Thompson, J.F.H., Goldfarb, R.J. and Richards, J.P., eds., *One Hundredth Anniversary Volume: Economic Geology*, p.111–141.
- Hayba, D.O., Bethke, P.M., Heald, P., and Foley, N.K., 1985, Geologic, mineralogic, and geochemical characteristics of volcanic-hosted epithermal precious metal deposits: *Reviews in Economic Geology*, v. 2, p. 129–167.
- Hawke. M., Corlett, G., Simpson, M., and Merchant. R., 1996, Petrographic studies of samples from the Kyaukmyet, Natche taung and Shwebontha prospects Myanmar. TLC Report: 96037.
- Heald, P., Foley, N.K., Hayba, D.O., 1987, Comparative anatomy of volcanichosted epithermal deposits: *Reviews in Economic Geology*, v.2, p. 129-167.
- Hedenquist, J.W., Reyes, A.G., Simmons, S.F., Taguchi, S., 1992, The thermal and geochemical structure of geothermal and epithermal systems: A framework for interpreting fluid inclusion data. *Eur. Jour.of Min.*, 4, 989–1015.

- Hedenquist, J.W., Lowenstern, J.B., 1994, The role of magmas in the formation of hydrothermal ore deposits. *Nature* 370, 519 –527.
- Hedenquist, J.W., Matsuhisa, Y., Izawa, E., White, N.C., Giggenbach, W.F., and Aoki, M., 1994, Geology, geochemistry, and origin of high sulfidation Cu-Au mineralisation in the Nansatsu district, Japan: *Economic Geology*, v. 89, p. 130.
- Hedenquist, J.W., Izawa, E., Arribas, A.R., and White, N.C., 1996, Epithermal Gold Deposits: Styles, Characteristics, and Exploration: The Society of Resource Geology: *Resource Geology Special Publication*, number 1, 70 p.
- Hedenquist, J.W., Arribas, A., 1998, Evolution of an intrusion-centered hydrothermal system: Far southeast Lepanto porphyry and epithermal Cu –Au deposits. Philippines. *Economic Geology*. 93, 373 –404.
- Hedenquist, J.W., Arribas, A., Jr., and Gonzalez-Urien, E., 2000, Exploration for epithermal gold deposits: Reviews in *Economic Geology*, v. 13, p. 245–277.
- Hedenquist, J.W., Sillitoe, R.H., and Arribas, A., 2004, Characteristics of and exploration for high-sulfidation epithermal Au-Cu deposits. In: In: Cooke, D.R., Deyell, C.L., Pongratz, J. (Eds.), 24 Carat Gold Workshop 5. Centre for Ore Deposit Research Special Publication, pp. 99 –110.
- Heinrich, C.A., Driesner, Stefánsson, T., and Seward, T.M., 2004, Magmatic vapor contraction and the transport of gold from the porphyry environment to epithermal ore deposits: *Geology*, v. 32, p. 821 –824.
- Henley, R.E., and Hughes, G.O., 2000, Underground Fumaroles: “Excess heat” effect in vein formation. *Economic Geology* 95 (3), p. 453-466.
- Henley, R.W., Berger, B.R., 2011, Magmatic-vapor expansion and the formation of high-sulfidation gold deposits: chemical controls on alteration and mineralization. *Ore Geol. Rev.* 39, 63 –74.
- Htay, T., 2011, Kyaukphyu Taung Gold Deposit, SSE of Sinkan village, Bhamo Township, Kachin State, Myanmar. *Journal of Myanmar Geosciences Society*, v.4, p. 1 -10.
- Htein, W., 1979, *Microscopic studies on ore minerals from Letpadaung Monywa*, R.A.S.U. Vol. 12. United Nations. New York.
- Htet. W.T., 2008, Volcanic-hosted gold-silver mineralization in the Monywa mining district, central Myanmar Phd.Dissteration, Mandalay University, January, 2008.

Irvine, T.N., and Baraga, W.R.A., 1971, A guide to the chemical classification of the common volcanic rocks. *Can. J. Earth Sci.*, 8, 523–548.

Jannas, R.R., Beane, R.E., Ahler, B.A., and Brosnahan, D.R., 1990, Gold and copper mineralization at the El Indio deposit, Chile: *Journal of Geochemical Exploration*, v. 36, p. 233–266.

Japanese Colombo Plan Project, 1973, *Report on geological survey of the Monywa area; Phase I* (Volume 1).

Jensen, E.P., and Barton, M.D., 2000, Gold deposits related to alkaline magmatism, in Hagemann, S. and Brown, P.E., eds., *Gold in 2000*, Society of Economic Geologists, *Reviews in Economic Geology*, v.13, p.274–319.

Jia Y.F., and Kerrich R., 2000, Giant quartz vein systems in accretionary orogenic belts: the evidence for a metamorphic fluid origin from d15N and d13C studies. *Earth Planet Sci Lett* 184:211–224.

Kamilli, R.J., and Ohmoto, H., 1977, Paragenesis, zoning, fluid inclusion, and isotopic studies of the Finlandia vein, Colqui district, Central Peru: *Economic Geology*, v. 72, p. 950–982.

Kesler, S.E., 2005, Ore-Forming Fluids. *Elements*, 1(1): 13–18.

Knight, J., and Zaw, K., 2015, The geochemical and geochronological framework of the Monywa high sulfidation Cu and low sulfidation Au-epithermal deposits, Myanmar. Poster No. 104 presented at the SEG 2015 Conference, 27–30 September, 2015, Hobart, Tasmania, Australia

Khin, A., and Win, K., 1969, Preliminary studies of the paleogeography of Burma during the Cenozoic-Union of Burma, *J. Sci. Technol.* (2<sup>nd</sup> Burma Res. Congr.: 1967), I, 2: 241–251.

Khin, M.M., 1970, *Geology and Copper Deposits of Sabe taung in Monywa District*.

Kouhestani, H., Ghaderi, M., Chang, Z., and Zaw, K., 2015, Constraints on the ore fluids in the Chah Zard breccia-hosted epithermal Au–Ag deposit, Iran. *Fluid inclusions and stable isotope studies. Ore Geol. Rev.* 65, 512–521.

Kriwin, D.J., 1994, *Technical assessment of the Monywa porphyry copper district, Mandalay province, Union of Myanmar*. vol. 1,2,3.

Large, R., Huston, D., Mc Goldbrick, P. and Mc Arture, G., 1988, Gold Distribution and Genesis in Paleozoic Volcanic Massive Sulphide System. *Geological Society of Australia*, 22, 121–128.



- Leach, T.M., and Corbett, G.J., 1995, Characteristics of low sulfidation gold-copper systems in the southwest Pacific, in Pacific Rim Congress 95, 19-22 November 1995, Auckland, New Zealand, proceedings: Carlton South, The Australasian Institute of Mining and Metallurgy, p. 327-332.
- Leach, T.M., 1996, *Comments on the High Sulfidation Copper Systems of the Monywa District, Myanmar*, p 1-20.
- Lindgren, W., 1933, Mineral deposits, 4<sup>th</sup> ed: New York, Mc Graw-Hill, p. 930.
- Liu, J., Mao, J.W., Wu, G., Wang, F., Luo, D.F., Hu, Y.Q., Li, T.G., 2014. Fluid inclusions and H-O-S-Pb isotope systematics of the Chalukou giant porphyry Mo deposit, Heilongjiang Province, China. *Ore Geol. Rev.* 59, 83 –96.
- Mahood, G.A., Hildreth, W., 1983, Nested calderas and trapdoor uplift at Pantelleria, Strait of Sicily. *Geology*, II: p. 722-726.
- Matsuhisa, Y. and Aoki, M., 1994, Temperature and oxygen isotope variations during formation of the Hishikari epithermal gold-silver veins, southern Kyushu, Japan: *Economic Geology*, v. 89, p.1608-1613.
- Maurin, T., Masson, F., Rangin, C., Min, T and Collard, P., 2010, First global positioning system results from northern Myanmar: constant and localised slip rate along the Sagaing Fault. *Geology*, 38, 591–594.
- McCaffrey, R., 2009, The tectonic framework of the Sumatran subduction zone. *Annual Review of Earth and Planetary Sciences* 37, p. 345–346.
- McClenaghan, L., 2013, *Geology and Genesis of the Newton Bulk-Tonnage Gold-Silver Deposit. Central British Columbia*. University of British Columbia.
- Mehrabi, B., Ghasemi Siani, M., Goldfarb, Richard, Azizi, H., Ganerod, Morgan, Marsh, Erin Elizabeth, 2016, Mineral assemblages, fluid evolution, and genesis of polymetallic epithermal veins, Glojeh district, NW Iran. *Ore Geol. Rev.* 78, 41 –57.
- Metz, J.M.; and Mahood, G.A., 1991, Development of the Long Valley, California, magma chamber record in precaldern rhyolite lavas of glass Mountain. *Contributions to Mineralogy and Petrology*. 106(3): p. 379-397.
- Middlemost, E.A.K., 1994, Naming materials in the magma/igneous rock system: *Earth Science Reviews*, v.37, no.1, p. 19-26.
- Middleton, C., Buenavista, A., Rohrlach, B., Gonzalez, J., Subang, L. and Moreno, G. 2004, A geological review of the Tampakan copper-gold deposit, southern

Mindanao, Philippines, in PACRIM 2004, AusIMM, Adelaide, Australia, September.

- Misra, K.C., 1999, *Understanding Mineral Deposits*, Kluwer Academic Publisher, 758 p.
- Mitchell, A.H.G., 1973, *Metallogenic Belts and Angle of Dip of Benioff Zones*: Mcmillan (Journal) Ltd., p-221.
- Mitchell, A.H.G., and McKerrow, W.S., 1975, Analogous evolution of the Burma orogeny and the Scottish Caledonides. Geological Society of America Bulletin 86, 305–315.
- Mitchell, A.H.G., and Garson, M.S., 1981, Mineral Deposits and Global Tectonic Settings. Academic Press, 405 p.
- Mitchell, A. H. G., 1986, Ophiolite and associated rocks in four setting: Relationship to Subduction and Collision. Tectonophysics, V 125, p 251-269.
- Mitchell, A.H.G., 1989, Mesozoic and Cenozoic regional tectonics and metallogenesis in Mainland SE Asia, GEOSEA V Proceedings Vol. I/, Geo/. Soc. Malaysia, pp. 221 -239.
- Mitchell, A.H.G., Corlett, G., Simpson, M., and Merchant, R., 1996, Petrographic Studies of Samples from the Kyaukmyet, NacheTaung and Shwebontha Prospects, Myanmar, p 1-151.
- Mitchell, A.H.G; Htay, N., Ausa, C., Deparine, L., Khin, A., and Po, S., 1999, Geological setting of gold districts in Myanmar. PACRIM 99, Bali, Indonesia. pp. 303-910.
- Mitchell, A. H. G., Myint, W., Lynn, K., Htay, M.T., Oo. M., and Zaw, T., 2008, The Monywa copper deposits, Myanmar: chalcocite-covellite veins and breccia dykes in a late Miocene epithermal system. *In* Proceedings of International Symposia on Geoscience Resources and Environments of Asian Terranes, GREAT 2008, Bull. Earth Sci. Thailand Special Issue, Department of Geology of Chulalongkorn University, Bangkok, Thailand, 219–222.
- Mitchell, A. H. G., Myint, W., Lynn, K., Htay, M.T., Oo. M., and Zaw, T., 2011, Geology of the High Sulfidation Copper Deposits, Monywa Mine, Myanmar. *Resource Geology* Vol. 61, No. 1: 1–29.
- Mitchell, A. H. G., Chung, S.-L., Thura Oo, Lin, T.-H. and Hung, C.-H. 2012, Zircon U-Pb ages in Myanmar: Magmatic-metamorphic events and the closure of a neo-Tethys ocean? *J. Asian Earth Sci.*, 56, p. 1 –23.



- Moncada, D., and Bodnar, R., 2012, Gangue mineral textures and fluid inclusion characteristics of the Santa Margarita Vein in the Guanajuato Mining District, Mexico. *Open Geosciences*, 4(2), p. 300-309.
- Morton, R., 2009, A Berif Guid to the Geology of Ore Deposits. *Economic Geology*, 4350, 83p.
- Muller, D. and Groves, D.I., 1997, Potassic Igneous Rocks and Associated Gold-Copper Mineralization. Springer-Verlag, Berlin, Heidelberg, 238 p.
- Myint, K.K., 1994, Mineral belts and epochs in Myanmar. *Resource Geology* 44. P 231-240.
- Naing, M.M., 2003, Petrology and mineralization of Sabe, Kyisin and Letpadaung copper deposits, Monywa District, Central Myanmar. Ph.D. Dissertation, University of Mandalay, Unpublished.
- Nakamura, N., 1974, Determination of REE, Ba, Fe, Mg, Na and K in carbonaceous and ordinary chondrites. *Geochim. Cosmochim. Acta*, 38, 757–775.
- Ouyang, H., Wu, X., Mao, J.W., Su, H., Santosh, M., Zhou, Z., Li, C., 2014, The nature and timing of ore formation in the Budunhua copper deposit, southern Great Xing'an Range: evidence from geology, fluid inclusions, and U-Pb and Re –Os geochronology. *Ore Geol. Rev.* 63, 238 –251.
- Pearce, J.A., and Cann, J.R., 1973, Tectonic setting of basic volcanic rocks determined using trace element analyses. *Earth Planet. Sci. Lett.*, 19, 290–300.
- Pearce, J. A., 1982, Trace element characteristics of lavas from destructive plate boundaries. In: Thorpe R.S. (ed.) *Andesites: Orogenic Andesites and Related Rocks*. John Wiley & Sons, Chichester, pp. 525-548.
- Pearce, J.A., 1983, Role of the sub-continental lithosphere in magma genesis at active continental margins. In: Hawkesworth, C.J., and Norry, M.J., (eds.), *Continental basalts and mantle xenoliths*. Shiva, Nantwich, pp. 230–249.
- Pearce J. A., Harris N. B. W. and Tindle A. G., 1984, Trace element discrimination diagrams for the tectonic interpretation of granitic rocks. *J. Petrol*, 25, p.956-983.
- Pearce, J. A., 1996, A user's guide to basalt discrimination diagrams. In: Wyman, D. A. (ed.) *Trace Element Geochemistry of Volcanic Rocks: Applications for Massive Sulphide Exploration*. Geological Association of Canada, Short Course Notes 12, 79–113.

- Pinfold, E.S., Day, A.E., Stamp, L.D., and Chibber H.L., 1927, Late Tertiary igneous rocks of the lower Chindwin region, Burma. *Trans Min Geol Inst India*, V 21, p 145-225.
- Pirajno, F., 2009, *Hydrothermal Processes and Mineral Systems*. Springer Geological Survey of Western Australia, Perth, WA, Australia.
- Potter R. W. 11, Clynne M. A., and Brown D. L., 1978, Freezing point depression of aqueous sodium chloride solutions. *Economic Geology*, 73.284–285.
- Reyes, A. G., 1990, Petrology of Phillipine geothermal systems and the application of alteration mineralogy to their assessment: *Journal of Volcanology and Geothermal Research*, v. 43, p. 279-309.
- Richard, J.P., 1995, Alkalic-type epithermal gold deposits-a review: *Mineralogical Association of Canada, Short Course*, v 23, pp 367–400.
- Roedder, E., 1970, Application of an improved crushing microscope stage to studies of the gases in fluid inclusions. *Schweiz. Mineral. Petrogr. Mitt.* 50, 41– 58.
- Roedder, E., 1977b, Changes in ore fluid with time, from fluid inclusion studies at Creede, Colorado. *Problems of Ore Deposition*. 4<sup>th</sup> IAGOD Symposium, Varna, Bulgariapp. 179–185.
- Roedder, E., 1984, Fluid inclusions. *Mineralogical Society of America. Reviews in Mineralogy*, vol. 12, 644 p.
- Rollinson, H., 1993, *Using Geochemical Data: Evaluation, Presentation, Interpretation*. Lonnman, London, 352 p.
- Rossetti, P., and Colombo, F., 1999, Adularia–sericite gold deposits of Marmato-Caldas, Colombia.: field and petrographic data. In: McCaffrey, K.J.W., Lonergan, L., Wilkinson, J.J. \_Eds., *Fractures, Fluid Flow and Mineralization*. Geological Society of London, Special Publications, v.155, pp. 167–182.
- Ruggieri, G., Lattanzi, P., luxoro, S.S., Dessi, R., Benvenuti, M., and Tanelli, G., 1997, Geology, mineralogy, and fluid inclusion data of the Furtei high sulfidation gold deposit, Sardinia, Italy: *Economic Geology*, v.92, p. 1- 19.
- Sander, M.V. and Black, J.E., 1988, Crystallization and recrystallization of growth zoned vein quartz crystals from epithermal systems – implications for fluid inclusions studies: *Economic Geology*, v. 83, p. 1052-1060.

- Sander, M.R. and Einaudi, M.T., 1990, Epithermal deposition of gold during transition from propylitic to potassic alteration at Round mountain, Nevada: *Economic Geology*, v. 85, p. 285-311.
- Saunders, J.A., 1994, Silica and gold textures in bonanza ores of the Sleeper deposit, Humboldt Country, Nevada: Evidence for colloids and implications for epithermal ore-forming processes. *Economic Geology* 89 (3), p. 628- 638.
- Scott, S.D., 1983, Chemical behavior of sphalerite and arsenopyrite in hydrothermal and metamorphic environments *Mineralogical Magazine*, vol.47, pp.427-435.
- Scott, S. D., and Barnes, H. L., 1971, Sphalerite geothermometry and geobarometry. *Economic Geology* 66, 653–669.
- Searle, M. P., Noble, S. R., Cottle, J. M., Waters, D. J., Mitchell, A. H. G., Tin Hlaing, Horstwood, M. S. A., 2007, Tectonic evolution of the Mogok Metamorphic Belt, Burma (Myanmar) constrained by U-Th-Pb dating of metamorphic and magmatic rocks, *American Geophysical Union, Tectonics*, vol. 26, p. 1 -24.
- Seward, T.M., and Barnes, H.L., 1997, Metal transport by hydrothermal ore fluids, in Barnes, H.L., ed., *Geochemistry of hydrothermal ore deposits*, 3 rd ed.: New York, John Wiley & Sons, p. 435–486.
- Shand, S. J., 1943, *Eruptive Rocks. Their Genesis, Composition, Classification, and Their Relation to Ore-Deposits with a Chapter on Meteorite*. John Wiley & Sons, New York.
- Sheehan, M., 1996, *Detail Mineralogy Report of the Monywa Copper District*. P 1-6.
- Shepherd, T.J., Ranbin, A.H., Alderton, D.H.M., 1985, In: *A Practical Guide to Fluid Inclusion Studies*. Blackie, Glasgow, pp. 223.
- Sherlock, R.L., Tosdal, R.M., Lehrman, N.J., Graney, J.R., Losh, S., Jowett, E.G., and Kesler, S.E., 1995, Origin of the McLaughlin mine sheeted vein complex: Metal zoning, fluid inclusion, and isotope evidence: *Economic Geology*, v. 90, p. 2156–2181.
- Sillitoe, R.H., 1993b, Epithermal models: genetic types, geometrical controls and shallow features, in Kirkham, R.V., Sinclair, W.D., Thorpe, R.L., and Duke, J.M., eds., *Mineral Deposit Modeling: Geological Association of Canada, Special paper 40*, p. 99-166.
- Sillitoe, R.H., and Hedenquist, J.W., 2003, Linkages between volcano-tectonic settings, ore fluid compositions, and epithermal precious metal deposits: *Society of Economic Geologists Special Publication*, 10, p. 315–343.

- Sillitoe, R. H., Marquardt, J. C., Ramirez, F., Becerra, H., and Gomez, M., 1996, Geology of the concealed MM porphyry copper deposit, Chuquicamata District, northern Chile In: Andean Copper Deposits: New Discoveries, Mineralization Styles and Metallogeny (Eds: F Camus, R H Sillitoe and R Petersen), Society of Economic Geologists, Special Publication, 5:59–69.
- Sillitoe, R. H., 1999, Styles of high-sulfidation Gold, silver and Copper Mineralization in Porphyry and Epithermal Environments, Bali, Indonesia. Pacrim 99, p 1-44.
- Simmons, S.F., and Browne, P.R.L., 2000, Hydrothermal minerals and precious metals in the Broadlands-Ohaaki geothermal system: Implications for understanding low-sulfidation epithermal environments: *Economic Geology*, v. 95, p. 971–999.
- Simmons, S.F., and Christenson, B.W., 1994, Origins of calcite in a boiling geothermal system: *American Journal of Science*, v.294, p. 361-400.
- Simmon, S.F., White, N.C., and John, D.A., 2005, Geological Characteristics of Epithermal Precious and Base Metal Deposits: *Economic Geology*, 100th Anniversary Volume pp. 485–522.
- Simmons, S.F., Brown, K.L., 2006, Gold in magmatic hydrothermal solutions and the rapid formation of a Giant ore deposit. *Science* 314, 288 –291.
- Stephenson, D., and Marshall, T. R., 1984, The petrology and mineralogy of Mt. Popa volcano and the nature of the late Cenozoic Burma volcanic arc. *J. Geol. Soc. London*, 141, 747– 766.
- Steven, T.A., and Ratté, J.C., 1960, Geology of ore deposits of the Summitville District, San Juan Mountains, Colorado: U.S. Geological Survey Professional Paper 343, 70 p.
- Stoffregen, R.E., 1987, Genesis of acid-sulfate alteration and Au-Cu-Ag mineralization at Summitville, Colorado: *Economic Geology*, v. 82, p. 1575–1591 In: Arribas, A. Jr., 1995, Characteristics of high-sulfidation epithermal deposits, and their relation to magmatic fluid: *Mineralogical Association of Canada Short Course*, v. 23, p. 419–454.
- Swe, Y.M., Aye, C.C, and Zaw, K., 2017, Gold deposit of Myanmar, Myanmar Geology Resources and Tectonic. Geological Society, London, Chp.15, p. 557–572.

- Takács, Á., Molnár, F., Turi, J., Mogessie, A., and Menzies, J.C., 2017, Ore mineralogy and fluid inclusion constraints on the temporal and spatial evolution of a high-sulfidation epithermal Cu-Au-Ag deposit in the recsk ore complex, Hungary. *Econ. Geol.* 112, 1461–148.
- Taylor, B.E., 1987, Stable isotope geochemistry of ore-forming fluids, in Kyser, T.K. ed., *Stable Isotope Geochemistry of Low Temperature Fluids: Mineralogical Association of Canada, Short Course Handbook*, v. 13, p.337-445.
- Taylor, B.E., 1988, Degassing of rhyolitic magmas: hydrogen isotope evidence and implications for magmatic hydrothermal ore deposits, in Taylor, R.P., and Strong, D.F., eds., *Recent advances in the geology of granite-related mineral deposits: Canadian Institute of Mining and Mineralogy, Special Volume 39*, p. 33-49.
- Thein. M., 1991, Mineral belts and mineral epochs of Myanmar a new synthesis, *Georeport*, V. 1, No. 1,1-10.
- Thein, M., 1992, Epithermal gold potential in Myanmar. *Epithermal gold in Asia and the Pacific Mineral Concentrations and Hydrocarbon Accumulation in the ESCAP Region*, p. 176, ST/ESCAP/1023, United Nations.
- Thein. M., 2000, Summary of the geological history of Myanmar. Unpublished paper, p.8.
- Thiersch, P.C., Williams-Jones, A.E., Clark, J.R., 1997, Epithermal mineralization and ore controls of the Shasta Au –Ag deposit, Toadoggon District, British Columbia, Canada. *Miner. Deposita* 32, 44–57.
- United Nations, 1978a, *Geology and Exploration Geochemistry of the Pinlebu-Banmauk area*, Sagaing Division, Northern Burma “Draft”, Technical Report No. 2. Geological Survey and Exploration Project, United Nations Development Programme, DP/UN/BUR-72-002, United Nations, 69p.
- United Nations, 1978b, *Geology and Mineralization of the Shangalon Copper Prospect and Surroundings*, Technical Report No. 1. Geological Survey and Exploration Project, United Nations Development Programme, DP/UN/BUR-72-002/10, United Nations, New York, 45p.
- United Nations, 1978c, *Memorandum, Letpadaung Taung “Draft”*, Technical Report No. 7. Geological Survey and Exploration Project, United Nations Development Programme, United Nations, DP/UN/BUR-72-002, 15p.

- United Nations, 1979, *Geology and Exploration Geochemistry of the Salingyi-Shinmataung area, central Burma*, Technical Report No. 5. Geological Survey and Exploration Project, United Nations Development Programme, DP/UN/BUR-72- 002/14, United Nations, New York, 29p.
- Yang, H.M., 2008, *Late Cenozoic Volcanic Rocks from Burma: Geochemical Characteristics and Petrogenesis*. M.Sc. Thesis, National Taiwan University, 70p.
- Wang, Y.Z., Li, S.R., Chen, G.H., Ouyang, Y.W., Li, Y.J., Yin, X.J., Li, Y.K., 2013, Geological characteristics and metallogenetic prediction of Gaosongshan gold deposit in Xunke of Heilongjiang Province. *Global Geol.* 32, 221 –228 (in Chinese with English abstract).
- Wang, L., Qin, K.Z., Song, G.X., Pang, X.Y., Li, Z.Z., Zhao, C., Jin, L.Y., Zou, X.Y., Li, G.M., 2018, Volcanic-subvolcanic rocks and tectonic setting of Zhengguang intermediate sulfidation epithermal Au-Zn deposit, eastern CAOB. *J. Asian Earth Sci.* 165, 328–351.
- Watters, B.R., and Pearce, J.A., 1987, Metavolcanic rocks of the La Ronge Domain in the Churchill Province, Saskatchewan: geochemical evidence for a volcanic arc origin, *in*: Pharaoh, T.C., Beckinsale, R.D., Richard, D. (Eds.), *Geochemistry and Mineralization of Proterozoic Volcanic Suites* Geological Society, Special Publications, vol.33, pp. 167-182.
- White, N.C., Hedenquist, J.W., 1990, Epithermal environments and styles of mineralization: variations and their causes, and guidelines for exploration. *J. Geochem. Expl.* 36, 445 –474.
- White, N.C., Hedenquist, J.W., 1995, Epithermal gold deposits: Styles, characteristics and exploration: *Society Economic Geologists Newsletter* 23, p. 1-13.
- White N.C., Leake, M.J., McCaughey, S.N., and Parris, B.W., 1995, Epithermal gold deposits of the southwest Pacific, *Journal of Geochemical Exploration*, 54, No.2, 87–136.
- Wilkinson, J.J., 2001, *Fluid inclusions in hydrothermal ore deposits*. Elsevier Science, *Lithos* 55 (2001), 229–272.
- Wilson M., 1989, *Igneous petrogenesis*. Unwin Hyman, London.
- Win, K. K., 1979, Distribution of some elements in Sabetaung Copper Deposit, Saling Township, Monywa area, Research paper, Geo. Sci.



- Wynn, K., and Kirwin, D., 1998, Exploration, geology and mineralization of the Monywa copper deposits, central Myanmar. *In* Porphyry and Hydrothermal Copper and Gold Deposits: A Global Perspective. Proceedings of the Australian Mineral Foundation Conference, Perth, Australia, 61–74.
- Win, S., 1997, The mineral potential of Myanmar. *Asian Journal of Mining* Sept-Oct. p 51-54.
- Woods, T.L., Roedder, E., Bethke, P.M., 1982, Fluid-inclusion data on samples from Creede, Colorado, in relation to mineral paragenesis. U.S. Geol. Surv. Open File Report 82-313, 77 p.
- Zaw, K., 1989, Comments on transcurrent movements in the Myanmar–Andaman sea region. *Geology* 17, 93–95.
- Zaw, K., 1990, Geological, petrological and geochemical characteristics of granitoid rocks in Burma: with special reference to the associated W–Sn mineralization and their tectonic setting. *Journal of South East Asian Earth Sciences* 4, 293–335.
- Zaw, K., 2014, Tectonics and metallogeny of mainland SE Asia – a review and contribution. Special issue on tectonics and metallogeny of mainland SE Asia. *Gondwana Research*, 26, 5–30.
- Zaw, K., 2015, Tectonic evolution of Myanmar: progress and problems. Paper presented at the AAPG/EAGE/MGS Conference: Innovation in Geoscience: Unlocking the Complex Geology of Myanmar, 19–20 November 2015, Yangon, Myanmar.
- Zaw, K., 2017, Overview of Mineralization Styles and Tectonic—Metallogenic Setting in Myanmar. *In*: Barber, A.J., Crow, M.J., Eds., Myanmar: Geology, Resources and Tectonics, the Geological Society (London) Memoir, v. 48, the Geological Society of London, London, 531-556.
- Zhai, W., Sun, X., Sun, W., Su, L., He, X., Wu, Y., 2009, Geology, geochemistry, and genesis of Axi: a Paleozoic low-sulfidation type epithermal gold deposit in Xinjiang, China. *Ore Geol. Rev.* 36 (4), 265 –281.
- Zhai, D.G., Liu, J.J., Wang, J.P., Yao, M.J., Wu, S.H., Fu, C., Liu, Z.J., Wang, S.G., Li, Y.X., 2013, Fluid evolution of the Jiawula Ag –Pb –Zn deposit, Inner Mongolia: mineralogical, fluid inclusion, and stable isotopic evidence. *Int. Geol. Rev.* 55 (2), 204 –224.