

REFERENCES

- Alderton, D.H.M., Pearce, J.A., Potts, P.J., 1980, Rare earth element mobility during granite alteration: evidence from southeast England. *Earth Planet. Sci. Lett.* 49, 149–165.
- Alzwar, M., Akbar, N., and Bachri, S., 1992, Systematic geological map, Indonesia, quadrangle Garut 1208-6 and Pameungpeuk 1208-3, scale 1:100.000: Geological research and development centre: 1 sheet.
- Angeles, C. A., Prihatmoko, S., and Walker, J.S., 2002, Geology and alteration-mineralization characteristics of the Cibaliung epithermal gold deposit, Banten, Indonesia. *Resource Geology*, 52, 329–339.
- Aoki, M. 1991, Mineralogical features and genesis of alunite solid solution in high temperature magmatic-hydrothermal systems. *Geol. Surv. Japan Report* 277, 35-37.
- Aoki, M., Comsti, E.C., Lazo, F.B., 1993, Advanced argillic alteration and geochemistry of alunite in an evolving hydrothermal system at Baguio, northern Luzon, Philippines. *Resource Geol.* 43, 155–164.
- Arifudin, 2005, Petrology, Geochemistry, and Compositional changes of diagnostic hydrothermal minerals within the Batu Hijau porphyry copper-gold deposit, Sumbawa Island, Indonesia: PhD dissertation, RWTH Aachen University, Germany. 352p.
- Arif, J., and Baker, T., 2004, Gold paragenesis and chemistry at Batu Hijau, Indonesia: Implications for gold-rich porphyry copper deposits. *Mineral Deposita*, 39, 523–535.
- 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.
- Arribas, A. Jr., Cunningham, C.G., Rytuba, J.J., Rye, R.O., Kelly, W.C., Podwysocki, M.H., McKee, E.H., Tosdal, R.M., 1995b, Geology, geochronology, fluid inclusions, and isotope geochemistry of the Rodalquilar gold alunite deposit, Spain. *Econ. Geol.* 90, 795–822.
- Aspden, J.A., Stephenson, B., and Cameron, N.R., 1982a, Tectonic map of northern Sumatra (1:500,000) British Geological Survey.
- Aspden, J.A., Stephenson, B., and Cameron, N.R., 1982b, The geology of the Padangsidempuan and Sibolda Quadrangles, Sumatra (1: 250,000). *Geol. Res. Dev. Centre*, Bandung.
- Barber, A.J., 1985, The relationship between the tectonic evolution of southeast Asia and hydrocarbon occurrences. In D.G. Howell (Editor), *Tectono-stratigraphic Terranes of the Circum-Pacific Region*. Circum-Pacific Council for Energy and Mineral Resources Earth Science Series No. 1, pp. 523–528.
- Basuki, A., Aditya Sumanagara, D., and Sinambela, D., 1994, The Gunung Pongkor gold-silver deposit, West Java, Indonesia, *Journal Geochemical Exploration*, 50, 371–391.
- Basuki, N.I., Prihatmoko, S., and Suparka. E., 2012, Gold Mineralization Systems in Southern Mountain Range, West Java, *Proceedings of Banda and*

- Eastern Sunda Arcs 2012 MGEI Annual Convention, 26-27 November 2012, Malang, East Java, Indonesia, 85-99
- Baumgartner, L.P. and Olsen, S.N., 1995, A least-squares approach to mass transport calculations using the Isocon method, *Econ. Geol.*, 90, 1261–1270.
- Benning, L.G., and Seward, T.M., 1996, Hydrosulfide complexing of Au (I) in hydrothermal solutions from 150-400° C and 500-1500 bar: *Geochemica et Cosmochimica Acta*, v.60, p. 1849–1871.
- Bodnar, R.J., 1993, Revised equation and table for determining the freezing point depression of H₂O–NaCl solutions. *Geochim. Cosmochim. Acta*. 57, 683–684.
- Bodnar, R.J., Reynolds, T.J., and Kuehn, C.A., 1985, Fluid inclusion systematics in epithermal systems. *Reviews in Economic Geology*. 2, 73–79. Bolliger, W. and de Ruiter, P.A.C., 1975, Geology of the South Central Java offshore Area: *Proc. of Indon. Petrol. Assoc.*, Jakarta, pp. 67–81.
- Bronto, S., 1989, Volcanic Geology of Galunggung, West Java, Indonesia, PhD Thesis (unpublished), University of Canterbury, p.490
- Carlile, J.C. and Mitchell, A.H.G., 1994, Magmatic arcs and associated gold copper mineralization in Indonesia, *Journal Geochemical Exploration*, 50, 91–142.
- Chen, P. Y., 1977, *Table of Key Lines in X-ray Powder Diffraction Patterns of Minerals in Clays and Associated Rocks*, Department of Natural Resources Geological Survey Occasional Paper 21, Indiana, 41 p.
- Clode, C., Proffett, J., Mitchell, P. and Munajat, I., 1999, Relationships of intrusion, wall-rock alteration and mineralization in the Batu Hijau copper-gold porphyry deposit, *Proceedings, PACRIM'99 Congress*, Bali, Indonesia; 485–498.
- Cole, J. M., and Crittenden, S., 1997, Early Tertiary basin formation and the development of lacustrine and quasi-lacustrine/marine source rocks on the Sunda Shelf of SE Asia, in A. J. Fraser, S. J. Matthews, and R. W. Murphy, eds., *Petroleum Geology of SE Asia: Geological Society of London Special Publication*, v. 126, p. 147–183.
- Cooke, D.R., and Simmons, S.F., 2000, Characteristics and genesis of epithermal gold deposits: *Reviews in Economic Geology*, v. 13, p. 221–244.
- 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.
- Corbett, G.J., and Leach, T.M., 1998, Southwest Pacific Rim gold-copper systems: Structure, alteration and mineralization: *Society of Economic Geologists, Special Publication* 6, 236 p.
- Craig, J.R., and Vaughan, D.J., 1994, *Ore Microscopy and Ore Petrography* (second ed.). Wiley Inter-science, New York, N.Y.
- Craig, J.R. 2001, Ore-Mineral Textures and the Tales They Tell, *The Canadian Mineralogist*, V.39, p.937– 956.

- Dardji, N., Villemain, T. and Rampnoux, J.P., 1994, Paleostress and strike-slip movement: The Cimandiri Fault Zone, West Java, Indonesia, *Journal of Southeast Asian Earth Sciences*, v. 9, p. 3–11.
- Davis, D.W., Lowenstein, T.K and Spencer, R.J, 1990, Melting behavior of fluid inclusions in laboratory-grown halite crystals in the systems NaCl-H₂O, NaCl-KCl-H₂O, NaCl-MgCl₂-H₂O, NaCl-CaCl₂-H₂O. *Geochim. Cosmochim. Acta*.
- Dill, H. 2001, The geology of aluminium phosphates and sulphates of the alunite group minerals: a review. *Earth Sci. Rev.*, 53, 35–93.
- Dill, H. 2003, A comparative study of APS minerals of the Pacific Rim fold belts with special reference to South American argillaceous deposits, *Journal of South American Earth Sciences* 16, 301–320.
- 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.
- Fournier, R.O., 1987, Conceptual models of brine evolution in magmatic-hydrothermal systems: U.S Geological Survey Professional Paper 1350 (2), p.1487–1506.
- Fournier, R.O., 1999, Hydrothermal processes related to movement of fluid from plastic into brittle rock in the magmatic–epithermal environment. *Econ Geol* 94: 1193–1211.
- Fulignati, P., Gioncada, A., Sbrana, A., 1999, Rare earth element (REE) behaviour in alteration facies of the active magmatic–hydrothermal system of Volcano (Aeolin Island, Italy). *Journal of Volcanology and Geothermal Research* 88, 325–342.
- Garcia, J.S., Jr., 1991, Geology and mineralization characteristics of the Mankayan mineral district, Philippines: Japan Geological Survey Report 277, p.21–30
- Garwin, S.L., 2002, The geologic setting of intrusion-related hydrothermal systems near the Batu Hijau porphyry copper-gold deposit, Sumbawa, Indonesia. *Society of Economic Geologists, Special Publication* No. 9, 333–366.
- Giggenbach, W.F., 1992, Magma degassing and mineral deposition in hydrothermal systems along convergent plate boundaries: *Economic Geology*, v. 87, p. 1927–1944.
- Giggenbach, W.F., 1997, The origin and evolution of fluids in magmatic hydrothermal systems, in Barnes, H.L., ed., *Geochemistry of hydrothermal ore deposits*, 3rd ed.: New York, John Wiley & Sons, p. 737–796.
- Giggenbach, W. F. and Stewart, M. K., 1982, Processes controlling the isotopic composition of steam and water discharges from steam vents and steam-heated pools in geothermal areas. *Geothermics*, 11, 71–80.
- Gonzalez, D., 1994, Geology and mineralization of the Big Gossan area, Ertsberg (Gunung Bijih) District, Irian Jaya, Indonesia. Ph.D thesis (Unpublished), Univ. Texas, Austin.

- Grant, J.A., 1986, The isocon diagram; a simple solution to Gresens' equation for metasomatic alteration: *Econ. Geol.*, v.81, p.1976–1982.
- Gresens, R.L., 1967, Composition-volume relationships of metasomatism; *Chem. Geology*, v. 2, p. 47–55.
- Haas J.L. Jr., 1971, The effect of salinity on the maximum thermal gradient of a hydrothermal system at hydrostatic pressure. *Econ Geol.* 66, 940–946.
- Hall, D. L., Sterner S. M., and Bodnar R. J., 1988, Freezing point depression of NaCl-KCl-H₂O solutions. *Economic Geology*, 83, 197–202.
- Hall, R., 2002, Cenozoic geological and plate tectonic evolution of SE Asia and the SW Pacific: computer-based reconstructions. Model and animations. *Journal of Asian Earth Sciences*, 20, 353–431.
- Hamilton, W.H., 1979, Tectonics of the Indonesian region. U.S. Geological Survey Professional Paper, 1078, 345 pp.
- 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.
- Harijoko, A., Sanematsu, K., Duncan, R.A., Prihatmoko, S., and Watanabe, K., 2004, Timing of the mineralization and volcanism at Cibaliung gold deposit, western Java, Indonesia, *Resource Geology*, 54, 187–195.
- Harijoko, A., Ohbuchi, Y., Motomura, Y., Imai, A., and Watanabe, K., 2007, Characteristics of the Cibaliung gold deposit: Miocene low-sulfidation type epithermal gold deposit western Java, Indonesia. *Resource Geology*, 57, 114–123.
- Harrison, R., Elfina and Wulandari Mandradewi., 2011, The practical application of spectral analysis in regional exploration and geological modelling at the Tujuh Bukit Project, east Java, Indonesia, *Proceedings HAGI-IAGI Makassar 2011 Joint Convention Makassar*, Makassar, 27-29 September 2011.
- Hatmanda, M., 2013, Geology and Characteristics of High-Sulfidation Epithermal Gold Deposits in Cijulang Prospect, Papandayan District, Garut, West Java. M.Sc Thesis (unpublished).
- 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.
- Heald, P., Foley, N.K., and Hayba, D.O., 1987, Comparative anatomy of volcanic-hosted epithermal deposits: Acid sulfate and adularia-sericite types: *Economic Geology*, v. 82, p. 1–26.
- Hedenquist, J.W. and Henley, R.W., 1985, The importance of CO₂ on freezing point measurements of fluid inclusions: Evidence from active geothermal systems and implications for epithermal ore deposition: *Econ. Geol.*, v. 80, p. 1379–1406.
- Hedenquist, J.W., and Lowenstern, J.B., 1994, The role of magmas in the formation of hydrothermal ore deposits: *Nature*, v. 370, p. 519–527.

- 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., Y. Matsuhisa., E. Izawa., N. White., W. Giggenbach., M. Aoki., 1994, Geology, geochemistry, and origin of high sulphidation Cu-Au mineralization in the Nansatsu District, Japan. *Econ. Geol.*, 89, 1–30.
- Hedenquist, J. W., Izawa, E., Arribas, A., Jr., and White, N.C., 1996, Epithermal gold deposits: Styles, characteristics, and exploration: Poster and booklet, Resource Geology Special Publication 1, 17p. (with translations to Spanish, French, Japanese, and Chinese).
- 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.
- Heinrich, C. A., Driesner, T., Stefansson, A., and Seward, T. M., 2004, Magmatic vapor contraction and the transport of gold from porphyry to epithermal ore deposits. *Geology*, 32(9):761–764.
- Hemley, J.J., Hostetler, P.B., Gude, A.J., & Mountjoy, W.T., 1969, Some stability relations of alunite: *Economic Geology*. V.64, p.599–612.
- Hemley, J.J., Montoya, J.W., Marinenko, J.W. & Luce, R.W., 1980, Equilibria in the system Al_2O_3 - SiO_2 - H_2O and some general implications for alteration/ mineralisation processes *Econ. Geol.* 75, 210–228.
- Hemley, J.J, Cygan, G.L, Fein, J.B, Robinson, G.R, and D'Angelo, W.M., 1992, Hydrothermal ore-forming processes in the light of studies in rock-buffered systems 1 Iron–copper–zinc–lead sulfide solubility relations. *Econ Geol* 87(1):1–22
- Henley R.W. 1990, Ore transport and deposition in epithermal environments. In: Herbert, H.K. & Ho, S. (Eds) Stable isotope and fluid processes in mineralization. Geology Departament of the University of Western Australia. Publication n. 23, p. 51-69
- Henley, R.W., and McNabb, A., 1978, Magmatic vapor plumes and groundwater interaction in porphyry copper emplacement: *Economic Geology*, v.73, p.1-20.
- Hezarkhani, A., 2002, Mass changes during hydrothermal alteration/mineralization in a porphyry copper deposit, eastern Sungun, northwestern Iran: *Journal of Asian Erath Science*, v. 20, p. 567–588.
- Hopf, S., 1993, Behaviour of rare earth elements in geothermal systems of New Zealand. *Journal of Geochemical Exploration* 47, 333–357.
- Humphris, S.E., Alt, J.C., Teagle, D.A.H., and Honnorez, J.J., 1998, Geochemical changes during hydrothermal alteration of basement in the stockwork beneath the active TAG hydrothermal mound. In Herzig, P.M., Humphris, S.E., Miller, D.J., and Zierenberg, R.A. (Eds.), *Proc. ODP, Sci. Results*, 158: College Station, TX (Ocean Drilling Program), 255–276.
- Hutchison, C.S., 1989, Geological evolution of South-East Asia. Oxford Monographs on Geology and Geophysics, Oxford, UK: Clarendon Press.

- Hutchison, C.S., 1973, Tectonic evolution of Sundaland: A phanerozoic synthesis, *Geol. Soc. Malaysia Bull.*, 6, 61–86.
- ICDD, 2001, Powder Diffraction File. International Center for Diffraction Data, Newtown Square, PA, USA.
- Idrus, A., Kolb, J. and Meyer, F.M., 2007, Chemical composition of rock-forming minerals in copper–gold-bearing tonalite porphyries at the Batu Hijau deposit, Sumbawa Island, Indonesia: Implications for crystallization conditions and fluorine- chlorine fugacity. *Resource Geology*, 57, 102–113.
- Imai, A., and Ohno. S., 2005, Fluid inclusion study and primary ore mineral assemblages of the Batu Hijau porphyry Cu-Au deposit, Sumbawa, Indonesia. *Resource Geology*, 55, 239–248.
- Imai, A., Shinomiya, J., Soe, T.H., Setijadji, L.D., Watanabe, K., and Warmada, I.W., 2007, Porphyry-Type Mineralization at Selogiri Area, Wonogiri Regency, Central Java, Indonesia, *Resource Geology*, 57, No. 2: 230–240.
- 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.
- Ishikawa, Y., Sawaguchi, T., Iwaya, S., and horiuchi, M., 1976, Delineation of prospecting targets for Kuroko deposits based on modes of volcanism of underlying dacite and alteration halos: *Mining Geology*, v.26, p.105–117 (in Japanese with English abs.).
- Ismayanto, A.F., Syafrizal, Notosiswoyo, S., 2009, Characteristic of Hydrothermal Mineralization at Gunung Subang Area, Cianjur District, West Java, International Conference Earth Science and Technology, Yogyakarta 6-7 August 2009.
- Jannas, R.R., Beane, R.E., Ahler, B.A., and Brosnahan, D.R., 1990, Gold and copper mineralization at the El Indio deposit, Chile, *In* Hedenquist, J.W., White, N.C., and Siddeley, G., eds., *Epithermal gold mineralization of the circum Pacific: Journal of Geochemical Exploration*, v. 35, p. 197–232.
- Jensen, E.P., and Barton, M.D., 2000, Gold deposits related to alkaline magmatism, in Hagemann, S. and Brown, P.E., *Gold in 2000: Society of Economic Geologists, Reviews in Economic Geology*, v.13, p.274–319.
- Johnson, B.D., Powell, C.McA. & Veevers, J.J., 1976, Spreading history of the eastern Indian Ocean and Greater Indias's northward flight from Antarctica and Australia, *Geol. Soc. Amer. Bull.*, 87, 1560–1566.
- Katchan, G., 1982, Mineralogy and geochemistry of the Ertsberg (Gunung Bijih) and Ertsberg East (Gunung Bijih Timur) skarns, Irian Jaya, Indonesia and the OK Tedi Skarns, Papua New Guinea. Ph.D. thesis, University of Sydney, 498 pp.
- Katili, J.A., 1973b, Geochronology of West Indonesia and its implications on plate tectonics, *Tectonophysics*, 19, 195–212.
- Katili, J.A., 1975, Volcanism and plate tectonics in the Indonesian island arcs, *Tectonophysics*, 26, 165–188.

- Katili, J.A., 1980, Geotectonics of Indonesia, a modern view. Directorate General of Mines Jakarta, Publication, 271 pp.
- Keetley, J. T., Cooper, G. T., Hill, K. C., Kusumabrata, Y., O'Sullivan, P. B., and Saefudin II, 1997, The structural development of the Honje High, Bayah High, and adjacent offshore areas, West Java, Indonesia.
- Knight, J.E., 1977, A thermochemical study of alunite, enargite, luzonite, and tennantite deposits: *Economic Geology*, v. 72, p. 1321-1336.
- Koesoemadinata, R.P. and Pulunggono, A., 1975, Geology of the Southern Sunda shelf in reference to the tectonic framework of Tertiary sediment basins of Western Indonesia, *J. Indo. Assoc. Geol.*, 2, 1-11.
- Kretz, R., 1983, Symbols for rock forming minerals, *American Mineralogist*, Volume 68, pages 277-279, 1983.
- Le Bas, M.J., Le Maitre, R.W., Streckeisen, A. & Zanettin, B., 1986, A chemical classification of volcanic rocks based on the total alkali-silica diagram. *Journal of Petrology*. Oxford. Vol. 27, 745-750.
- Lemigas, 1975, Peta anomali gaya berat bebas udara di Jawa Barat Selatan, unpublished report.
- Lewis, A.J., Palmer, M.R., Sturchio, N.C., Kemp, A.J., 1997, The rare earth element geochemistry of acid-sulphate and acid-sulphate-chloride geothermal systems from Yellowstone National Park, Wyoming, USA. *Geochimica et Cosmochimica Acta* 61, 695-706.
- Lottermoser, B.G., 1992, Rare earth element and hydrothermal ore formation processes. *Ore Geology Review* 7, 25-41.
- MacDonald, G.D. and Arnold, L.C., 1992, Intrusive and Mineralization History of the Grasberg Deposit, Irian Jaya, Indonesia. *A.I.M.E. Preprint Number* 3-92, 10 pp.
- MacLean W.H., and Kranidiotis, P., 1987, Immobile elements as monitors of mass transport in hydrothermal alteration: Phelps Dodge massive sulfide deposit, Matagami: *Econ. Geol.*, V.82, p.951-962.
- Mancano, D.P., and Campbell, A.R., 1995, Microthermometry of enargite-hosted fluid inclusions from the Lepanto, Philippines, high-sulfidation Cu-Au deposit: *Geochimica et Cosmochimica Acta*, v. 59, p. 3909-3916.
- Marcoux, E. and Milési, J.P., 1994, Epithermal gold deposits in West Java, Indonesia: geology, age and crustal Source. *Journal Geochemical Exploration*, 50, 393-408.
- Martodjojo, S., 1984, Bogor Basin evaluation, West Java (Evolusi Cekungan Bogor, Jawa Barat), Doctorate thesis, ITB. Bandung, Indonesia: 238p (unpublished).
- Martodjojo, S., 2003, Evolution of Bogor Basin, West Java. Institute of Technology Bandung press, 238p.
- Maryono, A., Lubis, H., Perdankusumah, A. and Hermawan, W., 2005, The Elang Porphyry Copper and Gold Mineralization Style Sumbawa, Indonesia, *Indonesian Minerals and Coal Discoveries*, 19-20 September 2005, IAGI.
- Maryono, A., Setijadji, L.D., Arif, J., Harrison, R., and Soeriaatmadja, E., 2012, Gold, Silver and Copper Metallogeny of the Eastern Sunda Magmatic Arc Indonesia, *Proceedings of Banda and Eastern Sunda Arcs 2012*

- MGEI Annual Convention 26-27 November 2012, Malang, East Java, Indonesia.
- Mertig, H.J., Rubin, J.N., and Kyle, J.R., 1994, Skarn Cu-Au orebodies of the Gunung Bijih (Ertsberg) District, Irian Jaya, Indonesia, *Journal of Geochemical Exploration*, 50, 179–202.
- Michard, A., Albarede, F., 1986, The REE content of some hydrothermal fluids. *Chem. Geol.* 55, 51–60.
- Michard, A., 1989, Rare earth element systematics in hydrothermal fluid. *Geochimica et Cosmochimica Acta* 53, 745–750.
- Middleton, T.W. 2003, The *Diari-Sedex* Zn-Pb project, North Sumatra. Indonesia-Discovery to Feasibility, Unpublished Report, Herald Resources Limited.
- Milési, J.P., Marcoux, E., Nehlig, P., Sunarya, Y., Sukandar and Felenc, J., 1994, West Java, Indonesia: a 1.7 My hybrid epithermal Au-Ag-Sn-W deposit, *Economic Geology*, 89, 227–245.
- Milési, J.P., Marcoux, E., Sitorus, T., Simandjuntak, M., Leroy, J., and Baily, L., 1999, Pongkor (West Java): A Pliocene supergene enriched epithermal Au-Ag-(Mn) deposit. *Mineral Deposita*, 34, 131–149.
- Minster, J.B. & Jordan, T.H., 1978, Present-day plate motions, *J. Geophys. Res.*, 83, 5331–5354.
- Mitchell, A.H.G., and Leach 1991, T.M., *Epithermal Gold in the Philippines: Island Arc Metallogensis, Geothermal Systems and Geology*. 457pp. London, Academic Press.
- Moëlo Y, Makovicky E, Mozgova NN, Jambor JL, Cook N, Pring A, Paar W, Nickel EH, Graeser S, Karup-Møller S, Balic-Žunic T, Mumme WG, Vurro F, Topa D, Bindi L, Bente K, Shimizu M, 2008, Sulfosalt systematics: a review. Report of the sulfosalt sub-committee of the IMA Commission on Ore Mineralogy. *Eur J Mineral* 20:7–46.
- Moore, G.F. and Karig, D.E., 1980, Structural geology of Nias Island, Indonesia: Implications for subduction zone tectonics, *Amer. J. Sci.*, 280, 193–223.
- Nakamura, N., 1974, Determination of REE, Ba, Fe, Mg, Na and K in carbonaceous and ordinary chondrites. *Geochim. Cosmochim. Acta*, 38, 757–775.
- Newcomb, K.R. and McCann, W.R., 1987, Seismic history and seismotectonics of the Sunda Arc, *J. Geophys. Res.*, 92, 421–439.
- O'Connor, G.V., Sunyoto, W., and Soebari L., 1999, The discovery of the Wabu Ridge gold skarn, Irian Jaya, Indonesia. *Proceedings PACRIM '99 Congress, Bali*. AusIMM, pp 549–557.
- Ohmoto, H., 1986, Stable isotope geochemistry of ore deposits: in Valley, J.W., Taylor Jr, H. P. and O'Neil, J.R., eds., *Stable isotopes in high temperature geological processes*, *Reviews in Mineralogy*, Mineralogical Society of America, MCMXIX, v.16, p.491–570
- Ohmoto, H., and Rye, R. O., 1979, *Isotopes of sulfur and carbon* In Barnes, H, L., ed., *Geochemistry of hydrothermal ore deposits*, 2nd ed.: New York, Wiley, p. 509-567.

- Palacios, C.M., Hein, U.F., Dulski, P., 1986, Behaviour of rare earth elements during hydrothermal alteration at the Buena Esperanza copper–silver deposit, northern Chile. *Earth Planet. Sci. Lett.* 80, 208–216.
- Parsapoor, A., Khalili, M., Mackizadeh, M.A., 2009, The behaviour of trace and rare earth elements (REE) during hydrothermal alteration in the Rangan area (Central Iran). *Journal of Asian Earth Sciences* 34, 123–134
- 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., 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.
- Pertamina-ITB, 2002, Regional tectonic study of Java and hydrocarbon potential of Central Java and West Java basins, Unpublished report.
- Perelló, J.A., 1994, Geology, porphyry Cu-Au, and epithermal Cu-Au-Ag mineralization of the Tombulilato District, North Sulawesi, Indonesia, *Journal of Geochemical Exploration*, 50, 221–256.
- Potdevin, J. L., 1993, Gresens 92: A simple Macintosh program of the Gresens method: *Computers & Geosciences*, v. 19, p. 1229–1238.
- 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.
- Pulunggono, A., and Martodjojo, S., 1994, Perubahan tektonik Paleogen-Neogen Merupakan peristiwa tektonik penting di Java; *Proceeding Geologi and Geologi Tektonik Pulau Jawa*, ISBN, UGM Yogyakarta, p. 37–51.
- Rangin, C., Jolivet, L. and Pubellier, M., 1990, A simple model for the tectonic evolution of Southeast Asia and the Indonesian region for the past 43 m.y. *Bull. Soc. Geol. France* 8, VI, 6: 889–905.
- Reyes, A.G., 1990, Petrology of Phillippine 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., 1984, Fluid inclusions. *Mineralogical Soc. Am., Rev. Mineral.* 12, p 646.
- Rollinson, H.R., 1993, *Using Geochemical Data: Evaluation, Presentation, Interpretation*. London: Longman.
- Rosana, M.F., and Matsueda, H., 2002, Cikidang hydrothermal gold deposit in Western Java, Indonesia. *Resource Geology*, 52, 341–358.
- Rully, A.S., Eko P.S., Elwin, E., Dwi, M., Gustina, H., Nico, O.S.L., and Rusiana, P., 2010, Zona Struktur Pongkor Kaitannya Dengan Mineralisasi. *Proceedings 39th Annual IAGI Convention and Exhibition, Lombok*, 027.
- Rustiadi, 1985, Unsur perak (Ag) di dalam beberapa mineral sulfida dai endapan jenis Kuroko di daerah Sangkaropi, Sulawesi. *RISSET* v.6, No.1, p. 32–41

- Rye, R.O., 1993, The evolution of magmatic fluids in the epithermal environment, *Economic Geology*, v. 87, p. 733–353.
- Rye, R.O., 2005, A review of the stable-isotope geochemistry of sulfate minerals in selected igneous environments and related hydrothermal systems: *Chemical Geology*, v. 215, p. 5–36
- Rye, R.O., Bethke, P.M., and Wasserman, M.D, 1992, The stable isotope geochemistry of acid-sulfate alteration. *Econ. Geol.* 87, 225–262.
- Saeki, Y., and Date, J., 1980, Computer application to the alteration data of the footwall dacite lava at the Ezuri Kuroko deposits, Akita Prefecture: *Mining Geology*, v.30, p.241–250 (in Japanese with English abs.).
- Sakai, H., and Matsubaya, O., 1977, Stable isotopic studies of Japanese geothermal systems: *Geothermics*, v. 5, p. 97-124.
- Sano, S., Untung, M. & Fujii, K., 1978, Epilogue: Some gravity features of Island Arcs of Jawa and Japan and their tectonic implications, in M. Untung & Y. Sato (eds.) ; *Gravity and Geological Studies in Jawa Indonesia*, *Geol. Surv. Landon. spec. publ.* 6,pp. 183–207.
- Sarwanto, 2009, Evaluation report of Jampang gold prospect of Hunamas, West Java. Internal report of PT AGC Indonesia (unpublished).
- Schiller, D.M., Garrard, R.A. and Prasetyo, L., 1991, Eocene submarine fan sedimentation in southwest Java, Indonesian Petroleum Association, *Proceedings 20th Annual Convention*, Jakarta, p. 125–182.
- Setijadji, L.D., Kajino, S., Imai, A., and Watanabe, K., 2006, Cenozoic island arc magmatism in Java Island (Sunda Arc, Indonesia): Clues on relationship between geodynamic of volcanic centers and ore mineralization. *Resource Geology*, 56, 267–292.
- Sewell, D.M., and Wheatley, C.J.V., 1994a, Integrated exploration success for gold at Wetar, Indonesia, *Journal of Geochemical Exploration*, 50, 337–350
- Sewell, D.M., and Wheatley, C.J.V., 1994b, The Lerokis and Kali Kuning submarine exhalative gold-silver-barite deposits, Wetar Island, Maluku, Indonesia, *Journal of Geochemical Exploration*, 50, 351–370
- Shinohara, H., 1994, Exsolution of immiscible vapor and liquid phases from a crystallizing silicate melt: Implications for chlorine and metal transport. *Geochim. Cosmochim. Acta* 58, 5215-5221.
- Sieh, K. and Natawidjaja, D., 2000, Neotectonics of the Sumatran Fault. *Journal of Geophysical Research*, 105, B1: p.8295–8326.
- Sillitoe, R.H., 1989, Gold deposits in western Pacific island arcs: The magmatic connection: *Economic Geology Monograph* 6, p. 274–291.
- Sillitoe, R.H., 1994, Indonesian mineral deposits-introductory comments, comparisons and speculations, *Journal of Geochemical Exploration* 50, 1–11.
- Sillitoe, R.H., 2010, Porphyry copper systems, *Economic Geology*, v. 105, pp. 3–41.
- Sillitoe, R.H., Angeles, C.A., Jr., Comia, G.M., Antioqua, E.C., and Abeya, R.B., 1990, An acid sulfate-type-lode gold deposit at Nalesbian, Luzon, Philippines: *Journal of Geochemical Exploration*, v. 35, p. 387–412.

- 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.
- Simmons, S, F., Christenson BW., 1994, Origins of calcite in a boiling geothermal system. *Am J Sci* 294: 361– 400.
- Simmons, 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.
- Soeria-Atmadja, R., Maury, R.C., Bellon, H., Pringgoprawiro, H., Polue, M., and Priadi, B., 1991, The Tertiary magmatic belts in Java. In: E. Prasetyo Utomo, H. Santoso and J. Supoheluwaken (Editors), *Dynamics of Subduction and its Products*, Research and Development Center for Geotechnology, Indonesian Institute of Sciences, Bandung, pp. 99–119.
- Soeria-Atmadja, R., Maury, R.C., Bellon, H., Pringgoprawiro, H., Polve, M., and Pria, B., 1994, Tertiary magmatic belts in Java, *Journal of Southeast Asian Earth Sciences*, 9, 13–27.
- 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
- Suasta, I.G.M., Sinugroho, I.A., 2011, Occurrence of zoned epithermal to porphyry type cu-au mineralization at Wonogiri, central Java, *Proceedings JCM Makassar 2011, The 36th HAGI and 40th IAGI Annual Convention and Exhibition Makassar, 26-29 September 2011*.
- Sun, S.S., and McDonough, W.S., 1989, Chemical and isotopic systematic of oceanic basalts: implications for mantle composition and processes. In: Saunders A.D., Norry M.J (Eds.), *Magmatism in the Ocean Basins*. Geological Society of London, Special Publication, 313–345.
- Sunarie, C.Y., Rosana, M.F., Watanabe, K., 2011, Gold Bearing Quartz Veins of Tanggeung Prospect, Cianjur, West Java, Indonesia, *Proceedings of the 1st Asia Africa Mineral Resources Conference 2011, Fukuoka, Japan*.
- Suparka, E., Aziz, M., Abdullah, C.I., Suparka., 2007, Mineralization of cu-au porphyry deposits in Cihurip and surrounding area, Garut Regency, West Java, Indonesia, *Proceedings Joint Convention Bali, The 32nd HAGI, The 36th IAGI, and The 29th IATMI Annual Conference and Exhibition*.
- Sutopo, B., Jones M.L., and Levet, B.K., 2003, The Martabe gold discovery: a high-sulfidation epithermal goldsilver deposit, north Sumatra, Indonesia.

- In New Gen Gold 2003 Conference, Case histories of discovery, Perth, Gold Mining J., Proc., p. 147–158.
- Syafrizal, Imai, A., Motomura, Y., and Watanabe, K., 2005, Characteristics of gold mineralization at the Ciurug vein, Pongkor gold-silver deposit, West Java, Indonesia. *Resource Geology*, 55, 225–238.
- Syafrizal, Imai, A. and Watanabe, K., 2007, Origin of ore-forming fluids responsible for gold mineralization of the Pongkor Au- Ag deposit, West Java, Indonesia: Evidence from mineralogic, fluid inclusion microthermometry and stable isotope data of the Ciurug-Cikoret veins. *Resource Geology*, 57, 136–148.
- Syafrizal, Indriati, T., Heriawan, M.N., Hede, A.N.H., Hutabarat, Y., and Saing, S., 2011, Base-metal and Gold Mineralization in Jampang Complex, Cigaru Local Mine, West Java, Indonesia, Proceedings of the 1st Asia Africa Mineral Resources Conference 2011, Fukuoka, Japan.
- Syahbuddin, A., Sumantri, V.R., Kartanegara, L. and Asikin, S., 1986, Pola perkembangan tektonik Cekungan Rangkasbitung, Jawa Barat, selama Tersier sebagai akibat dari letaknya yang berada di antara Cekungan Bogor, Cekungan Jawa Baratdaya dan Cekungan Sumatra Selatan, XV Annual Convent. Indon. Assoc. Geol., 9-10 December, Yogyakarta.
- Tapponnier, P., Peltzner, G., and Armijo, R., 1986, On the mechanism of the collision between India and Asia, in Coward, M. P., and Ries, A. C., eds., *Collision Tectonics: Spec. Pub.*, Geological Society of London, p. 115–157.
- Taylor, R.P., Fryer, B.J., 1980, Multi-stage hydrothermal alteration in porphyry copper systems in northern Turkey: the temporal interplay of potassic, propylitic and phyllic fluids. *Canadian Journal of Earth Science* 17, 901–926.
- Taylor, R.P., Fryer, B.J., 1982, Rare earth element geochemistry as an aid to interpreting hydrothermal ore deposits. In: Evans, A.M. (Ed.), *Metallization Associated with Acid Magmatism*. John Wiley, New York, pp. 57–365.
- Taylor, R.P., Fryer, B.J., 1983, Rare earth element lithogeochemistry of granitoid mineral deposits. *Bulletin of Canadian Institute Mine Metallurgy* 76, 74–84.
- Thompson, R.N., 1982, British Tertiary volcanic province. *Scott. J. Geol.*, 18, 49–107.
- Thompson, R.N., Morrison, M.A., Hendry, G.L. and Parry, S.J., 1984, An assessment of the relative roles of crust and mantle in magma genesis: an elemental approach. *Phil. Trans. R. Soc*, A310, 549–590.
- Titisari, A. D., 2014, Geochronology and geochemistry of Cenozoic volcanism in relation to epithermal gold mineralisation in western Java, Indonesia. PhD thesis, School of Earth Sciences, The University of Melbourne.
- Turner, S.J., Flindell, P.A., Hendri, D., Hardjana, I., Lauricella, P.F., Lindsay, R.P., Marpaung, B. and White, G.P., 1994, Sediment-hosted gold mineralisation in the Ratatotok District, North Sulawesi, Indonesia. In: T.M. van Leeuwen, J.W. Hedenquist, L.P. James and J.A.S. Dow

- (Editors), Indonesian Mineral Deposits Discoveries of the Past 25 Years. *Journal of Geochemical Exploration*, 50:317–336.
- Ulrich, T., and Heinrich, C.A., 2001, Geology and alteration geochemistry of the porphyry Cu-Au deposit at Bajo de la Alumbrera, Argentina. *Econ. Geol.*, v.96, pp. 1719–1741.
- Ulrich, T., Günther, D., Heinrich, C.A., 2001, Evolution of a porphyry Cu–Au deposit, based on LA–ICP–MS analysis of fluid inclusions: Bajo de la Alumbrera, Argentina. *Economic Geology* 96: 1743, correctly reprinted in 2002 97(8):1888–1920.
- Urashima, Y., Saito, M., and Sato, E., 1981, The Iwato gold ore deposits Kagoshima prefecture, Japan: Society of Mining geologists of Japan Special Issue10, p. 1-14 (in Japanese with English abs.).
- Van Bemmelen, R.W., 1949, *The Geology of Indonesia*, V.F.A. Government Printing Office, The Hague, 732 pp.
- Van Leeuwen, T.M., 1994, 25 Years of mineral exploration and discovery in Indonesia, *Journal of Geochemical Exploration* 50: 13–90.
- Van Nort, S.D., Atwood, G.W., Collinson, T.B., Flint, D.C., and Potter, D.R., 1991, Geology and mineralization of the Grasberg porphyry copper-gold deposit, Irian Jaya, Indonesia. *Mining Engineering*, 43, 300–303.
- Verdiansyah, O., Bangun, P., and Rahmat, I., 2012, High-sulfidation epithermal gold occurrences in Cijulang Area, Garut, West Java. *Proceeding of PIT IAGI Yogyakarta 2012, the 41th IAGI Annual Convention and Exhibition*.
- Warmada, I.W., Lehmann, B., and Simandjuntak, M., 2003, Polymetallic sulfides and sulfosalts of the Pongkor epithermal gold-silver deposit, West Java, Indonesia. *The Canadian Mineralogist* 41, 185–200.
- Warmada, I.W., Lehmann, B., Simandjuntak, M., and Hemes, H. S., 2007, Fluid inclusion, REE and stable isotope study of carbonate minerals from the Pongkor epithermal gold–silver deposit, West Java, Indonesia. *Resource Geology*, 57, 124–135.
- White, N.C., 1991, High-sulfidation epithermal gold deposits: Characteristics, and a model for their origin: *Geological Survey of Japan Report* 277, p. 9–20.
- White, N.C., 1993, Geochemistry of high sulfidation systems: *Mineral Deposits Studies Group Annual Meeting Abstracts Volume*, London, December 1993, pp. 72-73.
- White, N.C., and Hedenquist, J.W., 1990, Epithermal environments and styles of mineralization: Variations and their causes, and guidelines for exploration: *Journal of Geochemical Exploration*, v. 36, p. 445–474.
- 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.
- Whitney, D.L., and Evans, B.W., 2010, Abbreviations for names of rock-forming minerals, *American Mineralogist*, Volume 95, pages 185–187.
- Widi, B.N., 2007, Model Mineralisasi di Daerah Kubah Bayah: Suatu Pendekatan Strategi dalam Eksplorasi Mineral. *Proceeding Pemaparan Hasil*

Kegiatan Lapangan dan Non Lapangan Tahun 2007 Pusat Sumber Daya Geologi.

- Widi, B.N., and Matsueda, H., 2000, Epithermal gold-silver-tellurides deposit of Cineam, Tasikmalaya District, West Java, Indonesia, by, Directorate of Mineral Resources, Bandung, Special publication; No. 96, 19p.
- Wilkinson, J.J., 2001, Fluid inclusions in hydrothermal ore deposits, *Lithos* 55, 2001. p.229–272.
- William, N., 2000, The Basin Lake High Sulfidation Alteration System, Western Tasmania, Bechler Degree thesis (unpublished), University Of Tasmania, 103pp.
- Williams-Jones, A.E., Migdisov, A.A., Archibald, S.M., and Xiao, Z.F., 2002, Vapor-transport of ore metals. In: Hellmann R, Wood SA (eds) Water–rock interaction: a tribute to David A Crerar. The Geochemical Society, Special Publication, pp 279–305.
- Wilson, M., 1989, *Igneous Petrogenesis. A Global Tectonic Approach*. London: International Thompson, 466 pp.
- Winchester, J.A., and Floyd, P.A., 1977, Geochemical discrimination of different magma series and their differentiation products using immobile elements. *Chem. Geol.*, 20, 325–343.
- Wood, S.A., 1990, The aqueous geochemistry of the rare earth elements and yttrium: theoretical prediction in hydrothermal solutions to 350°C at saturation of water vapour pressure. *Chemical Geology* 88, 99–125.
- Yulianto, I., Hall, R., Clements, B., and Elders, C.R., 2007, Structural and stratigraphic evolution of the offshore Malingping block, West Java, Indonesia. Proceedings, Indonesian Petroleum Association, Thirty-First Annual Convention and Exhibition, May 2007.
- Yuningsih, E.T., Matsueda, H., 2011, Epithermal Gold-Silver-Base Metal Deposit of Arinem, West Java, Indonesia, Proceedings of the 1st Asia Africa Mineral Resources Conference 2011, Fukuoka, Japan.
- Yuningsih, E.T., Matsueda, H., and Rosana, M.F., 2010, Te-bearing gold-silver-basemetal mineral deposit of Arinem, West Java, Indonesia. Proceeding of IMA-2010, The 20th General Meeting of the International Mineralogical Association, Budapest. Hungary.
- Yuningsih E.T., Matsueda, H., Setyaraharja, E. P., and Rosana, M. F., 2011, The Arinem Te-bearing gold-silver-base metal deposit, West Java, Indonesia. *Resource Geology*: RG10–36.
- Yuningsih, E. T., Sutopo, B., Setyaraharja, E.P., Bangun, P., and Rosana, M.F., 2012, The Arinem Deposit: An Epithermal Gold-Silver-Base Metal Mineralization System, West Java Province, Indonesia. Proceedings of Banda and Eastern Sunda Arcs 2012 MGEI Annual Convention 26-27 November 2012, Malang, East Java, Indonesia.
- http://www.searg.rhul.ac.uk/pubs/hall_2009_Indonesia%20Islands.pdf