

## REFERENCES

Abu El-Enen, M.M., Okrusch M. and Will, T.M. (2004). Contact metamorphism and metasomatism at a dolerite-limestone contact in the Gebel Yelleq area, Northern Sinai, Egypt. *Mineralogy and Petrology* **81**, 135-164.

Akima, H. (1978). A Method of Bivariate Interpolation and Smooth Surface Fitting for Irregularly Distributed Data Point. *ACM Transactions on Mathematical Software*, **4**, p. 148-159.

Alva-Valdivia, L.M., Goguitchaichvili, A., Unutia-Fucugauchi, J., Caballere-Miranda, C., Vivillo, W. (2001). Rock-magnetism and Ore Microscopy of the Magnetite-apatite Ore Deposit from Cerro de Mercado, Mexico. *Earth Planets Space*, **53**, 181-192.

Anhaeusser, C.R. (2001). The Anatomy of an Extrusive-Intrusive Archaean Mafic-ultramafic Sequence: the Nelshoogte Schist Belt and Stolzberg Layered Ultramafic Complex, Barberton Greenstone Belt, South Africa. *South African Journal of Geology*. **104**, nr. 2, 167-204.

Anonymous (2007). African Rainbow Minerals: 2006 Annual Report. 188p.

Anonymous (2010). African Rainbow Minerals: 2010 Mineral Resources and Reserves. 33 p.

Armitage, P.E.B., MacDonald, I., Edwards, S.J. and Manby, G.M. (2002). Platinum-Group Element Mineralization in the Platreef and Calc-silicate Footwall at Sandsloot, Potgietersrus District, South Africa. *Transactions of the Institute of Mining and Metallurgy III* (Reprinted from Applied Earth Science, January-April 2002). B36-45.

Arndt, N.T. (2005). The Conduits of Magmatic Ore Deposits. In Mungall, J. (ed). Exploration for Platinum-group Element Deposits. Mineralogical Association of Canada. Special Volume. 181-201.

Arndt, N.T., Leshner, C.M., Czamanske, G.K. (2005). Mantle-derived Magmas and Magmatic Ni-Cu (PGE) Deposits. *Economic Geology, 100<sup>th</sup> Anniversary Volume.* 5-24.

Arndt, N.T., Czamanske, G.K., Walker, R.J., Chauvel, C. and Fedorenko, V.A. (2003). Geochemistry and Origin of the Intrusive Hosts of the Noril'sk-Talnakh Cu-Ni-PGE Sulphide Deposits. *Economic Geology*, **95**, 495-515.

Baker C.K. and Black P.M. (1982). Assimilation and Metamorphism at a Basalt-Limestone contact, Tokatoka, New Zealand. *Mineralogical Magazine*. **43**, 797-807.

Barnes, C.G., Prestvik, T., Sundvoll, B and Surratt, D. (2005). Pervasive assimilation of carbonate and silicate rocks in the Horavaer igneous complex, north-central Norway. *Lithos* .**80**, 179-199.

Barnes, S-J, Melezhik, V.A., Sokolov, S.V. (2001). The Composition and mode of Formation of the Pechenga Nickel Deposits, Kola Peninsula, Northwestern Russia. *The Canadian Mineralogist* **39**, 447-471.

Becker M., de Villiers, J. and Bradshaw, D. (2010). The Mineralogy and Crystallography of Pyrrhotite from Selected Nickel and PGE Ore Deposits. *Economic Geology*; **105**; p. 1025-1037.

Blom, M.P. (1988). Selected Magnetic and Gravity Anomalies in the Eastern Transvaal and Their Possible Relationship to the Rustenburg Layered Suite. Unpublished MSc. University of Pretoria, 53p.

Bottinga, Y and Javoy, M. (1990). The Degassing of Hawaiian Tholite. *Bulletin of Volcanology*, **53**, 73-85.

Boudreau, A.E. and McCallum, I.S. (1992). Concentrations of Platinum-Group Elements by Magmatic Fluids in Layered Intrusions. *Economic Geology* **87**, 1830-1848.

Bowen, N.L. (1940). Progressive Metamorphism of Siliceous Limestone and Dolomite. *Journal of Geology*, **48**, 225-274.

Brownlow, A.H. (1979). *Geochemistry*. Prentice-Hall Inc. Eaglewood Cliffs, New York. 30-31.

Bucher-Nurminen, K. (1982). On the Mechanism of Contact Aureole Formation in Dolomitic Country Rock by the Adamello Intrusion (Northern Italy). *American Mineralogist*, **67**, 1101-1117.

Butcher, A.R., Merkle, R.K.W. (1991). Unusual Textures and Structures associated with a Magnetite Layer in the Bushveld Complex: a Contribution to the Adcumulus Debate. *Mineralogical Magazine*, **55**, 465-477.

Chandraharam D., Vaselli O., Sheth H.C. and Keshav S. (2000). Petrogenetic Significance of Ferro-enstatite Orthopyroxene in Basaltic Dikes from the Tapi Rift, Deccan Flood Basalt Province, India. *Earth and Planetary Letters* **179**, 469-476.

Craig J.R and Vaughn D.J. (1990). Composition and Textural Variations of the Major Iron and Base-metal Minerals. In: *Sulphide Deposits - Their Origin and Processing*. (Ed) Gray P.M.J., Bowyer G.J., Castle J.F., Vaughn D.J. and Warner N.A. The Institution of Mining and Metallurgy, 1 – 16.

Cui, X., Nabelek, P.I. and Liu, M. (2003). Reactive Flow of Mixed CO<sub>2</sub>-H<sub>2</sub>O Fluid and Progress of Calc-silicate Reactions in Contact Metamorphic Aureoles: Insights from

Two-dimensional Numerical Modelling. *Journal of Metamorphic Geology*. **21**, Issue 7, 663-684.

d'Ars, J de B., Arndt, N.T., Hallot, E. (2001). Analog Experimental Insights into the Formation of Magmatic Sulphide Deposits. *Earth and Planetary Science Letters*, **186**, 371-381.

Dawood, Y.H., Abd El-Naby, H.H. and Sharafelden, A.A. (2004). Influence of the Alteration Process on the Origin of Uranium and Europium Anomalies in Trachyte, Central Eastern Desert, Egypt. *Journal of Geochemical Exploration*, **88**, 15-27.

Deblond, A., Tack, L. (1999). Main characteristics and review of mineral resources of the Kabanga-Musongati mafic-ultramafic alignment in Burundi. *Journal of African Earth Sciences*. **29**, No 2, 313-328.

Deer, W.A., Howie, R.A., Zussman, J. (1997). *The Rock-forming Minerals Vol 2B, Double-chain Silicates*, 2<sup>nd</sup> Edition. Longman, 764p.

Deer, W.A., Howie, R.A., Zussman, J. (1992). *An Introduction to the Rock-forming Minerals* 2<sup>nd</sup> Edition. Longman.696p.

De Nooy D. (2003). Mineralogy of the Base Metal Sulphide Mineralization of the Uitkomst Complex. *Mineralogy and Geochemistry of Base Metal Deposits in Southern Africa – Implications for Exploration and Beneficiation*. Proceedings Volume. 11-13.

De Waal S.A., (1977). Carbon Dioxide and Water from Metamorphic Reactions as Agents for Sulphide and Spinel Precipitation in Mafic Magmas. *Transactions of the Geological Society of South Africa*, **80**, 193-196.

De Waal S.A., Gauert C.D.K. (1997). The Basal Gabbro Unit and the Identity of the Parental Magma of the Uitkomst Complex, South Africa. *South African Journal of Geology*, **100(4)**, 349-361.

De Waal, S.A., Graham, I.T. and Armstrong R.A. (2006). The Lindques Drift and Heidelberg Intrusions and the Roodekraal Complex, Vredefort, South Africa: Comagmatic Plutonic and Volcanic Products of a 2055 Ma Ferrobasaltic Magma. *South African Journal of Geology* **109** nr. 3, 279-300.

De Waal, S.A., Maier, W.D., Armstrong, R.A. and Gauert, C.D.K. (2001). Parental Magma and Emplacement of the Stratiform Uitkomst Complex, South Africa. *The Canadian Mineralogist* **39**, 557-571.

Dipple, G.M. and Ferry, J.M. (1996). The Effect of Thermal History on the Development of Mineral Assemblages During Infiltration-Driven Contact Metamorphism. *Contributions to Mineralogy*, **124**, 334-345.

Dodd D.C. (2004). Exploration Strategies for Nickle Sulphide Deposits. Unpublished MSc. Dissertation. University of Pretoria. 134p.

Dokuchaeva, V.S. and Yakovlev, Y.N. (1994). Monchegorsk Pluton. *Geological Institute KSC RAS. 7<sup>th</sup> International Platinum Symposium. Kola Belt of Layered Intrusions. Guide to the Pre-symposium field trip July 27-31, 1994.* Edited by: Mitrofanov, F. and Torokhov, M. 71-108

Ebel, D.S. and Naldrett, A.J. (1996). Fractional Crystallisation of Sulphide Ore Liquids at High Temperature. *Economic Geology* **91**, 607-621.

Edwards, R. and Atkinson, K. (1986). Ore Deposit Geology and its Influence on Mineral Exploration. Chapman and Hall ltd, New York. p. 47.

Ernst R.E. and Buchan K.L. (1997). Layered Mafic Intrusions: a Model for Their Feeder Systems and Relationship with Giant Dyke Swarms and Mantle Plume Centres. *South African Journal of Geology*, **100(4)**, 319-334.

Evans, D.M., Byemelwa, L and Gilligan, J. (1999). Variability of magmatic sulphide compositions at the Kabanga nickel prospect, Tanzania. *Journal of African Earth Sciences* **29**, No 2, 329-351.

Evans, D.M, Boadi, I, Byemelwa, L., Gilligan, J., Kabete, J. and Marcet, P. (2000). Kabanga magmatic nickel sulphide deposits, Tanzania: morphology and geochemistry of associated intrusions. *Journal of African Earth Sciences* **30**, No 3, 651-674.

Ferry, J.M. (2000). Patterns of Mineral Occurance in Metamorphic Rocks. *American Mineralogist*. **85**, 1573-1588.

Ferry, J.M., Wing, A.B., Penniston, S.C. and Rumble, D.III (2002). The Direction of Fluid Flow During Contact Metamorphism of Siliceous Carbonate Rocks: New Data for the Monzoni and Predazzo Aureoles, Northern Italy and a Global Review. *Contributions to Mineralogy and Petrology*, **142**, 679-699.

Fulignati, P., Marianelli, P., Santacroce, R. and Sbaran, A. (2004). Probing the Vesuvius magma chamber-host rock interface through xenoliths. *Geological Magazine* **141** (4), 417-428.

Gain S.B. and Mostert A.B. (1981). The Geological Setting of the Platinoid and Base Metal Sulfide Mineralization in the Platreef of the Bushveld Complex in Drenthe, North of Potgietersrus. *Institute for Geological Research on the Bushveld Complex, Research Report nr. 28*. University of Pretoria. 22p.

Gain S.B. and Mostert A.B. (1982). The Geological Setting of the Platinoïd and Base Metal Sulfide Mineralization in the Platreef of the Bushveld Complex in Drenthe, North of Potgietersrus. *Economic Geology* **77**, 1395-1404.

Ganino, C, Arndt, N.T., Mei-Fu Zhou and Chauvel C. (2008). Interaction of magma with sedimentary wall rock and magnetite ore genesis in the Panzhihua mafic intrusion, SW China.. *Mineralium Deposita*, **43**, 677-694.

Gauert, C.D.K. (1998). The petrogenesis of the Uitkomst Complex, Mpumalanga Province, South Africa, PhD thesis, University of Pretoria, 315 p.

Gauert, C.D.K. (2001). Sulphide and Oxide Mineralization in the Uitkomst Complex, South Africa: Origin in a Magma Conduit. *Journal of African Earth Sciences*. **32**, nr. 2, 149-161.

Gauert C.D.K, de Waal S.A. and Wallmach T. (1995). Geology of the Ultrabasic to Basic Uikomst Complex: Eastern Transvaal, South Africa: an Overview. *Journal of African Earth Sciences*, **21**, 553-570.

Gauert C.D.K., Jordaan L.J., de Waal S.A. and Wallmach T. (1996) Isotopic Constrains on the Source of Sulphur for the Base Metal Sulphides of the Uitkomst Complex, Badplaas, South Africa. *South African Journal of Geology*, **99**, 41-50.

Giggenbach, W.F. (1989) Processes Controlling CO<sub>2</sub>- and Cl-Content of Thermal Discharges from the Taupo-Rotorua volcanic-magmatic-hydrothermal system, New Zealand. In: Water-Rock Interaction WRI6. Proceedings of the 6<sup>th</sup> international symposium, Malvern, U.K. Edited by Miles, D.L. A.A.Bakema/Rotterdam/Brookfield. 259-262

Gilg, H.A., Lima, A., Somma, R., Belkin, H.E., de Vio, B. and Ayuso, R.A. (2001). Isotope Geochemistry and Fluid Inclusion Study of Skarns from Vesuvius. *Mineralogy and Petrology*, **73**, 145-176.

Glazner, A.F. (2007). Thermal Limitation on Incorporation of Wall Rock into Magma. *Geology*, **35**, 319-322.

Gomwe, T., (2002). A Geochemical Profile Through the Uitkomst Complex on the Farm Slaaihoek, with Special Reference to the Platinum-group Elements and Sm-Nd isotopes. Unpublished MSc. Dissertation, University of Pretoria, 107p.

Grant, J.A. (1986). The Isocon Diagram – A Simple Solution to Gresen's Equation for Metasomatic Alteration. *Economic Geology* **81**, 1976-1982.

Gresens, R.L. (1967). Composition-volume Relationships of Metasomatism. *Chemical Geology*, **2**, 47-55.

Hall, A. (1996). Igneous Petrology 2<sup>nd</sup> Edition. Longman. Malaysia. p.26-28

Hammerbeck, E.C.I. and Schürmann (1998). Nickel *in*: The Mineral Resources of South Africa (M.G.C. Wilson and C.R. Anhaeusser, eds): Handbook, Council for Geoscience, **16**, 471-482.

Hanley, J.J and Mungull, J.E. (2003). Chlorine Enrichment and Hydrous Alteration of the Sudbury Breccia Hosting Footwall Cu-Ni-PGE Mineralization at the Frasier Mine, Sudbury, Ontario, Canada. *Canadian Mineralogist*, **41**, 857-881.

Harris, C. and Chaumba, J.B. (2001). Contamination and Fluid-Rock Interaction During the Formation of the Platreef, Northern Limb of the Bushveld Complex, South Africa. *Journal of Petrology* **42**, issue 7, 1321-1346.



- Hattingh P.J. (1980). The Structure of the Bushveld Complex in the Groblersdal-Lydenburg-Belfast Area of the Eastern Transvaal as Interpreted from a Regional Gravity Survey. *Transactions of the Geological Survey of South Africa*, **83**, p. 125 – 133.
- Hawley, J.E. (1965). Upside-down Zoning at Frood, Sudbury, Ontario. *Economic Geology*, **60**, 529-575.
- Hornsey R.A. (1999). The Genesis and Evolution of the Nkomati Mine Ni-Sulphide Deposit. Mpumalanga Province, South Africa. Unpublished MSc. Dissertation. University of Natal. 155p.
- Hui W.Y., Tenailleau C., Pring A. and Brugger J. (2004). Experimental Study of the Transformation of Pentlandite/Pyrrhotite to Violarite. *Regolith*, 146-150.
- Hulley, V. (2005). Reactions Between Country Rock Xenoliths and the Magma of Uitkomst Complex, with Implications for the Origin of the Sulphide Mineralization. Unpublished MSc. Dissertation. University of Pretoria. 117p.
- Irvine, T.N. (1977). Origin of Chromitite Layers in the Muskox Intrusion and Other Stratiform Intrusions: A New Interpretation. *Geology*, **5**, 273-277.
- Kacandes G.H., Ulmer G.C. and Grandstaff D.E. (1989). Monitoring the evolution of alteration minerals and fluids during a hydrothermal experiment. In Water-Rock Interaction WRI6. Proceedings of the 6<sup>th</sup> international symposium, Malvern, U.K. Edited by Miles, D.L. A.A.Bakema/Rotterdam/Brookfield. 353-356.
- Kenyon A.K., Attridge R.L., Coetzee G.L. (1986). The Uitkomst Nickel-Copper Deposit, Eastern Transvaal. 1009-1017. In: Anhaeusser C.R. and Maske S. (Eds) *Mineral Deposits of Southern Africa I*. Geological Society of South Africa. 1020p.

Kinnard, J.A., Hitchinson, D., Schurmann, L., Nox, P.A.M. and de Lange, R. (2005). Petrology and Mineralization of the Southern Platreef, Northern Limb of the Bushveld Complex, South Africa. *Mineralium Deposita*, **40**, 576-597.

Kruger, F.J. (2004). Filling the Bushveld Complex Magma Chamber: Lateral Expansion, Floor Interaction, Magmatic Unconformities and Chromite and PGE Deposits. Information Circular no. 377. Economic Geology Research Institute. Hugh Allsopp Laboratory. University of the Witwatersrand. Johannesburg. 28p.

Kruger, F.J. (2005). Filling the Bushveld Complex magma chamber: lateral expansion, roof and floor interaction, magmatic unconformities, and the formation of giant chromitite, PGe and Ti-V-magnetite deposits. *Mineralium Deposita*, **40(5)**, 451-472.

Lehmann, J., Arndt, N.T., Windley, B., Zhou, M.F., Wang, C., Harris, C. (2007). Geology, Geochemistry and Origin of the Jinchuan Ni-Cu-PGE sulfide deposit. *Economic Geology*, **102**, 75-94.

Levinson, A.A. (1974). Introduction to exploration geochemistry. Applied publishing Ltd., Illinois, U.S.A., 924 pp

Li C., Ripley, E.M., Maier W.D., Gomwe T.E.S. (2002). Olivine and Sulfur Isotopic Composition of the Uitkomst Ni-Cu Sulfide Ore-bearing Complex, South Africa: Evidence for Sulfur Contamination and Multiple Magma Emplacements. *Chemical Geology* **188**, 149-159.

Li, C., Naldrett, A.J., Coats, C.J.A. and Jonhannessen, P. (1992). Platinum, Palladium, Gold and Copper-rich Stringers at the Strathcona Mine, Sudbury: Their Enrichment by Fractionation of a Sulphide Liquid. *Economic Geology*, **87**, 1584-1598.

Li, C., Ripley, E.M. and Naldrett, A.J. (2001). Critical Factors for the Formation of a Nickel-copper Deposit in an Evolved Magma System: Lessons from a Comparison of the

Pants Lake and Voisey's Bay Sulfide Occurrence in Labrador, Canada. *Mineralium Deposita* **36**, 85-92.

Li, C., Ripley, E.M. and Naldrett A.J. (2003). Compositional Variations of Olivine and Sulfur Isotopes in the Noril'sk and Talnakh Intrusions, Siberia: Implications for Ore-Forming Processes in Dynamic Magma Conduits. *Economic Geology* **85**, 69-86.

Liebenberg L. (1968). The Sulphides in the Layered Sequence of the Bushveld Igneous Complex. Unpublished PhD Thesis. University of Pretoria. 260p.

Lipin, B.R. (1993). Pressure Increases, the Formation of Chromite Seams and the Development of the Ultramafic Zones in the Stillwater Complex, Montana. *Journal of Petrology*, **34**, 995-976.

Loubser, M and Verryn S. (2008). Combining XRF and XRD analyses and sample preparation to solve mineralogical problems. *South African Journal of Geology*, **111**, 229 - 238.

Lowenstern J.B. (2001). Carbon Dioxide in Magmas and Implications for Hydrothermal Systems. *Mineralium Deposita* **36**, 490-502.

MacDonald, I., Holwell, D.A., Armitage, P.E.B. (2005). Geochemistry and Mineralogy of the Platreef and "Critical Zone" of the Northern Lobe of the Bushveld Complex, South Africa: Implications for Bushveld Stratigraphy and the Development of PGE Mineralization. *Mineralium Deposita*, **40**, 526-549.

Maier W.D. and Barnes S-J (2003). Magmatic Ni-Cu-PGE Sulphide Deposits: Genesis and Exploration. *Short course on Magmatic Cu-Ni-PGE Sulphide Deposits*. Department of Geology, University of Pretoria. 1-61.

Maier W.D., Gomwe T., Barnes S-J, Li C., Theart H.F.J. (2004). Platinum Group Elements in the Uikomst Complex, South Africa. *Economic Geology* **99**, 499-516.

Maier, W.D., Li, C. and de Waal, S.A. (2001). Why are there no Major Ni-Cu Sulphide Deposits in Large Layered Mafic Ultramafic Intrusions? *The Canadian Mineralogist*. **39**, 547-556.

Maier, W.D., Sliiep, J., Barnes, S-J, de Waal, S.A. and Li, C. (2001). PGE-bearing Mafic-ultramafic Sills in the Floor of the Eastern Bushveld Complex on the Farms Blaawboschkraal, Swartkopje and Waterval. *South African Journal of Geology*, **104**, 343-354.

Manyeruke T.D. (2003). The Petrography and Geochemistry of the Platreef of the Farm Townlands, near Potgietersrus, Northern Bushveld Complex. Unpublished MSc. Dissertation. University of Pretoria. 99p.

Marsh, J.S. (2003). Review of South African Research on Volcanic and Related Rocks and Mantle Derived Materials: 1999-2002. *South African Journal of Science* **99**, 381-388.

Mathez E.A. and Mey J.L. (2005). Character of the UG2 Chromitite and Host Rocks and Petrogenesis of its Pegmatiodal Footwall, Northeastern Bushveld Complex. *Economic Geology* **100**, 1617-1630.

McBirney, A.R. (1993). *Igneous Petrology*. Jones & Bartlett Publishers. p.342.

McLeod P., Stephen R., Sparks J. (1998). The Dynamics of Xenolith Assimilation. *Contributions to Mineralogy and Petrology* Issue **132**, 21-33.

Morimoto N. (1989). Nomenclature of pyroxenes. *Canadian Mineralogist* **27**, 143-156.

Morse S.A., Owens B.E., Butcher A.R. (1987). Origin of Finger Structures in the Rhum Complex: Phase Equilibrium and Heat Effects. *Geological Magazine* **124**, 205-210.

Mostert A.B. (1982). A Mineralogical and Petrographical Investigation of the Platreef on Dente 778LR, NW of Potgietersrus. Unpublished MSc. Dissertasion. University of Pretoria. 82p.

Murck, B.W. and Campbell, I.H. (1986). The Effects of Temperature, Oxygen Fugacity and Melt Composition on the Behaviour of Chromium in Basic and Ultrabasic Melts. *Geochimica et Cosmochimica Acta*, **50**, 1871-1887.

Naldrett, A.J., Ebel, D.S., Asif, M., Morrison, G. and Moore, C.M. (1997). Fractional Crystallisation of Sulphide Melts as Illustrated at Noril'sk and Sudbury. *European Journal of Mineralogy*, **9**, 365-377.

Naldrett, A.J. (1981). Nickel Sulphide Deposits: Classification, Composition and Genesis. *Economic Geology*, **75**, 628-685.

Naldrett, A.J. (1999). World Class Ni-Cu-PGE Deposits: Key Factors in their Genesis. *Mineralium Deposita*, **34**, 227-240

Neradovsky, Y.N., Borisova, V.V., Sholokhnev, V.V. (1997?). The Monchegorsk Layered Complex and Related Mineralization. *4<sup>th</sup> Biennial SGA Meeting. August 11-13, 1997, Turku, Finland. Excursion Guidebook B4 Ore Deposits in the Kola Peninsula, Northwestern Russia.* Edited by Mirtofanov, F., Torokhov, M. and Iljina, M. pp27-31

Owens, B.E. (2000). High-temperature contact metasomatism of calc-silicate xenoliths in the Kiglapait Intrusion, Labrador. *American Mineralogist* **85**, 1595-1605.

Park, C.F. and MacDiarmid, R.A. (1975). *Ore Deposits 3<sup>rd</sup> Edition.* W.H. Freeman and Company. San Francisco. 141-142.

Perritt, S. and Roberts M. (2007) Flexural-slip structures in the Bushveld Complex, South Africa? *Journal of Structural Geology*, **29**, p. 1422 – 1429.

Polovina, J.S. Hudson, D.M. and Jones, R.E. (2004). Petrographic and Geochemical Characteristics of Postmagmatic Hydrothermal Alteration and Mineralization in the J-M Reef, Stillwater Complex, Montana. *Canadian Mineralogist*, **42**, 261-277.

Povoden E., Horacek M. and Abart R. (2002). Contact Metamorphism of Siliceous Dolomite and Impure Limestones from the Werfen Formation in the Eastern Monzoni Contact Aureole. *Mineralogy and Petrology*, **76**, 99-120.

Robb, L. (2005). Introduction to Ore-forming Processes. Blackwell publishing. Australia. 48-53.

SACS (South African Committee for Stratigraphy) (1980). Stratigraphy of South Africa. Part 1 (Kent, L.E. comp.), Lithostratigraphy of the Republic of South Africa, South West Africa/Namibia and the Republics of Bophuthatswana, Transkei and Venda. *Handbook for the Geological Survey of South Africa*, **8**, 690 p.

Sakar, A., Ripley, E.M. and Li, C. (2005). Oxygen and Hydrogen Isotopic Studies of the Uitkomst Ni-Cu Sulfide Deposit, South Africa: Evidence of Selective Crustal Contamination, Multiple Magma Injection, and Hydrothermal Alteration. *Geological Society of America Abstracts with Programs*, **37**, No. 7, 451.

Sakar, A., Ripley, E.M., Li, C. and Maier, W.D. (2008). Stable isotope, fluid inclusion, and mineral chemistry constraints on contamination and hydrothermal alteration in the Uitkomst Complex, South Africa. *Chemical Geology*, **257**, p. 129-138.

Schürmann, L.W., Grabe, P-J and Steenkamp, C.J. (1998). Chromium in The Mineral Resources of South Africa: Handbook, Council for Geoscience, **16**, 90-105.

Shannon, K (1981). Assessment Report Geological and Geochemical survey Barb claims 1-3. Atlin Mining Division. 22 p.

Sharp , M.R. and Chadwick, B. (1981). The Geometry and Origin of Structures in Certain Transvaal Sequence Rocks within and Adjacent to the Eastern Compartment of the Bushveld Complex. Institute for Geological Research on the the Bushveld Complex, University of Pretoria, Report No. 27, 19 p.

Shoji, T. (1975). Role of Temperature and CO<sub>2</sub> Pressure in the Formation of Skarn and Its Bearing on Mineralization. *Economic Geology*, **70**, 739-749.

Singh, V and de Nooy, C.D. (2003). Mineral Investigation of Eighty-six Borehole Core Samples Derived from the Pit1 and 2 Areas of the Nkomati Mine. Minlab Project P1176, Moruo Mineralogical Services, Florida, South Africa, 48 p.

Smith, L and Kotze J. (2010). Challenges of Open Pit Dewatering for an Intrusive Ore Body. “Mine Water and Innovative Thinking”, IMWA 2010 Abstracts, p. 59- 62.

Snyman, C.P. (1996). Geologie vir Suid-Afrika (in Twee Volumes). Departement van Geologie. University of Pretoria. 534-536.

Snyman, J.E.W. (1998). Gemstones *in* The Mineral Resources of South Africa (M.G.C. Wilson and C.R. Anhaeusser, eds): Handbook, Council for Geoscience, **16**, 284.

Spandler C., Mavrogenes J. and Arculus R. (2005). Origin of Chromitites in Layered Intrusions: Evidence form Chromite-hosted Melt Inclusions from the Silverwater Complex. *Geology*, **33**, nr. 11, 893-896.

Stanton, R.L. (1972). Ore Petrology. McGraw Hill, Johannesburg, South Africa. 713 p.

- Steenkamp, N.C. (2004). The Origin of the Wehrlite Layers hosted in the Lower Harzburgite (Lower Pyroxenite) Unit of the Uitkomst Complex. Unpublished Hons. Dissertation, University of Pretoria. 47p.
- Steenkamp, N.C. (2009). In-house guide: XRF and XRD Sample Preparation and - Instrument Operation. University of Pretoria. Unpublished in-house guide. 18p.
- Strauss, T.A.L. (1995). Petrology and Geochemistry of the Basal Gabbro Unit, Uitkomst Complex. MSc. Dissertation, Rhodes University. 103p.
- Taber, S. (1917). Pressure Phenomena Accompanying the Growth of Crystals. *Proceedings of the National Academy of Sciences of the United States of America*, **3**, 297-302.
- Theart, H.F.J. (1997). The Geology of the Shallow Chromite Resource within the Uitkomst Complex. Unpublished Report. 9p.
- Theart, H.F.J. (2000). The Geology of the Uitkomst Complex. Unpublished Report. 57p.
- Theart H.F.J and de Nooy C.D. (2001) The Platinum Group Minerals in Two Parts of the Massive Sulphide Body of the Uitkomst Complex, Mpumalanga, South Africa. *South African Journal of Geology* .**104**, 287-300.
- Therriault, R.D., Barnes, S-J and Severson, M.J. (1997). The Influence of Country-rock Assimilation and Silicate to Sulfide Ratio (R factor) on the genesis of the Dunka Road Cu- Ni-Platinum-Group element deposit, Duluth Complex, Minnesota. *Canadian Journal of Earth Science* **34**, 375-389.
- Tilley, C.E. and Harwood, H.F. (1931). The Dolerite-Chalk Contact of Scawt Hill Co. Antrim. The Production of Basic Alkali-rocks by the Assimilation of Limestone by Basaltic Magma. *The Mineralogical Magazine*, **22**, 439-468.



Ulmer, G.C. (1969). Experimental Investigation on Chromite Spinel. *Monographs in Economic Geology*, **4**, 114-131.

Uytenbogaart W. and Burke E.A.J. (1985). Tables for Microscopic Identification of Ore Minerals. Elsevier Publishing Company, Amsterdam. 430p.

Van Zyl A.M. (1996). The Sulphides of the Uitkomst Complex, Badplaas, South Africa. Unpublished MSc. Dissertation. University of Pretoria. 121p.

Ward, J.H.W. and Wilson, M.G.C. (1998). Gold Outside the Witwatersrand Basin in The Mineral Resources of South Africa (M.G.C. Wilson and C.R. Anhaeusser, eds): Handbook, Council for Geoscience, **16**, 361-363.

Wallmach, T.W. (1988). The Petrogenesis of High Grade Contact Metamorphic Mineral Assemblages in Calc-silicate Xenoliths, Eastern Bushveld Complex, South Africa. Unpublished PhD thesis, University of Pretoria. 201p.

Wallmach, T.W., Hatton, C.J., de Waal, S.A. and Gibson, R.L. (1995). Retrogressive Hydration of Calc-silicate Xenoliths in the Eastern Bushveld Complex: Evidence for Late Magmatic Fluid Movement. *Journal of African Earth Sciences*. **21 (4)**, 633-646.

Wallmach T.W., Hatton C.J., Droop G.T.R. (1989). Extreme Facies of Contact Metamorphism Development in Calc-Silicate Xenoliths in the Eastern Bushveld Complex. *Canadian Mineralogist* **27**, 509-523.

Watson, J.S. (1996). Fast, Simple Method of Powder Pellet Preparation for X-Ray Fluorescence Analysis. *X-Ray Spectrometry*, **25**, 173-174

Wenzel, T. Baumgartner, L.P. Brugmann, G.E. Konnikov, E.G. Kislov, E.V. and Orsoev, D.A. (2001). Contamination of Mafic Magma by Partial Melting of Dolomitic Xenoliths. *Terra Nova*, **13**, issue 3, 197-202.

Wenzel, T. Baumgartner, L.P. Brugmann, G.E. Konnikov, E.G. and Kislov, E. (2002). Partial Melting and Assimilation of Dolomitic Xenoliths by Mafic Magma: the Iokodovyren Intrusion (North Baikal Region, Russia) *Journal of Petrology*, **13** number 11, 2049-2074.

Willemse, J. and Bensch, J.J. (1964). Inclusion of Original Carbonate Rocks in Gabbro and Norite of the Eastern Part of the Bushveld Complex. *Transactions Proceedings Geological Society of South Africa*. **67**, 1-87.

Winkler, H.G.F. (1974). *Petrogenesis of Metamorphic Rocks*. Springer-Verlag. New York Inc. 348p.

Woolfe, J.A.S. (1996). The Nkomati Joint Venture – a Nickel Mine in the Making. *Geobulletin* **39** (1), 5-7

**Website visited:**

<http://www.arm.co.za> (accessed bimonthly from January 2005 – April 2008).