

Ho fuputsa liphiri tsa northern limb: lekalana le ikhethang la Bushveld Complex

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Bushveld Complex, e tsebahalang lefats'eng ka bophara ka letlotlo la eona la lirafshoa tsa *Platinum Group Elements (PGEs)* le *chromium (Cr)*, e fumaneha profinseng ea *Limpopo*, Afrika Boroa. Bushveld Complex, e nale li karoloana kapa makalana a manthla a mararo; bophirima, bochabela le leboea (*eastern, western and northern limbs*). Leha ho bile le boramahlale ba bangata ba ithukhubelitseng ho utloisisa sebopeliso sa *Bushveld Complex*, re hlokomela hore thota esa namme kaha ho sana le liphiri tse ngata ka hare ho mohloli ona oa liminerale, haholo-holo lekalane la eona le ka leboea (*northern limb*). Makalana a Bushveld complex a ka bophirima le bochabela ke mafahla, li tšoana hantle, hape leruo la tsona la lirafshoa le utloisisoa hantle. Empa lekalana le ka leboea le fapane tu! Lekalana lena le na le lits'obotsi tse ikhethang tse le khethollang, tse etsang hore e be thahasello ea lona ho bo ramahlale e totile lilemong tse mashome a mabeli tsa ho feta.

Lipatlisiso tsa rona tsa morao-rao li shebane le sebaka sa Uitloop, se lutseng moeling o ka bochabela oa northern limb, haufi le terotsoana e bitsoang Mokopane. Boithuto bona bo hlahloba li-isotope tsa sebabole ( $\delta^{34}S$ ,  $\Delta^{33}S$ , le  $\Delta^{36}S$ ) ka hare ho liminerale tsa sebabole (*i.e. pyrrhotite, pentlandite, chalcopyrite le pyrite*) tse fumanehang ka hare ho majoe a *Lower Zone*, *Platreef/Critical Zone* le *Transvaal Supergroup*. Sebabole, e leng karolo ea bohlokoa limineraleng tsena, e na le seabo sa bohlokoa ho hlohlletsa 'sulphur saturation', e leng tshebetso e tataisang pokello ea lits'epe tsa koporo (*Cu*), nikele (*Ni*) le sehlopa sa liminerale etsa polatinum (*PGEs*) ka hare ho majoe a lihlopa tsa Bushveld Complex eleng *Critical Zone* le *Platreef*. Nahana ka sebabole e le motsoako oa lekunutu oa risepe e thusang ho ritela liminerale tsena tsa bohlokoa. Empa sebabole see se tsoa hokae? Mona ke moo e bang monate le ho feta: le hoja hona le tumellano e tiileng hore sebabole se bapala karolo ea bohlokoa ho bokella lits'epe ka hare ho *Critical Zone le Platreef*, lipuisano li ntse li tsoela pele hara bo ramahlale.

Li-isotope li re thusa ho fumana hore na sebabole sena se tsoa mokhubung oa lefats'e (*magmatic origin*) nakong ea Paleoproterozoic kapa ka holima lefats'e (*sedimentary origin*) nakong ea *Archaean*. Ho tšoana le ha re leka ho fumana hore na ntho ea khale - khale e popiloe lilemo tse libilione tse nne ho isa ho tse peli le halefo (4 – 2.5 Ga, *Archaean*) tse fetileng, kapa morao-rao ho tloha lilemong tse kabang 2.5 – 1.6 bilion tse fetileng. Hona ke khopotso e

qabolang ea kamoo litsebi tsa jeoloji li buang feela ka liketsahalo tse fapaneng ka lilemo tse libilione joalokaha eka li etsahetse maobanyana mona.

Ho araba lipotso tsena, re sebelisitse mekhoha ea *sulfur isotope systematics* ( $\delta^{34}S$ ,  $\Delta^{33}S$ , le  $\Delta^{36}S$ ) ho latela mehloli le lits'ebetso tse amang popeho ea *magmatic sulfide deposits* sebakeng sa Uitloop. Liphuputso tsa rona li totobatsa ts'usumetso ea *Great Oxygenation Event (GOE)* ho thehoeng ha manoni a liminerale tsa Uitloop. GOE, e ileng ea etsahala lilemong tse libilione tse 2.4 tse fetileng, e ile ea hlahisa oxygene e ngata sepakapakeng sa Lefats'e. Ketsahalo ena e lebisitse ho nts'etsopela ea *sulphate evaporates*, haholo-holo nakong ea *Paleoproterozoic*, ts'imollong ea bokaholimo ba *Duitschland Formation*. Li-evaporite tsena li ile tsa tsoakana le seretse se nyolohang mpeng ea lefats'e, ho tsosa *sulfide saturation*, ts'ebetso e hlohlellang pokello ea *Cu-Ni-PGE* ka hare ho majoe a lihlopa tsa *Lower Zone le Critical Zone/Platreef* hona Uitloop. Ka bokhuts'oane, thuto ena e fana ka pono e fellelseng ea hore na *magmatic differentiation, crustal assimilation*, le maemo a leholimo a fetohang (*GOE*) nakong ea Paleoproterozoic li kentse letsoho ho haha moruo oa lirafshoa e fumanoang Uitloop. Patlisiso ena ke tlatsetso mosebetsing oa boramahlale ba hlahlobileng pokello ea lirafshoa tsa *Platreef Cu-Ni-PGEs* libakeng tse haufi le Uitloop.

Ha ke atamela ho phetha lengolo la *PhD in Economic Geology*, leholiotsoana la morero ona le ntlohetse ka lipotso tse ngata tse arabiloeng le tse sa arajoang. Empa ke botle ba lipatlisiso tsa mahlale, akere? *Bushveld Complex* e ntse e tsoela pele ho ba mohloli o makatsang, ho sa ntse ho ena le ho hongata ho lokelang ho senoloa. Patlisiso ea rona e tsoelang pele e ikemiselitse ho koala likheo tsa tsebo ka lekalana le ka leboea la Bushveld Complex. Ho tseba betere ka lipatlisiso tsena, ka tataiso ea lisupervisor tsaka, Dr. Marina Yudovskaya le Prof. Paul Nex, mosebetsi ona o rometsoe hore o phatlalatsoe koranteng (*Journal*) e hloahloa e bitsoang *Geology*, e oelang tlasa *Geological Society of America*. Sehloho sa pampiri eo ke; '*A contribution of Paleoproterozoic sulphates to Bushveld sulphides*', mme etla phatlalatsoa mafelong a selemo sena.