Supplementary Material S1: Selection of ages of relevant tectono-metamorphic events in the Central African Copperbelt

Age	Error	Authors	What	Dating technique
883	10	Armstrong *et al* 2005	Nchanga Red Granite A-type	U–Pb SHRIMP on magmatic zircons in cross-bedded Lower Roan quartzite
880	12	Johnson *et al* 2007	Kafue Rhyolite (likely associated with anorogenic-Nchanga granite)	U–Pb on zircon grains
880	14	Johnson *et al* 2007	Nazingwe Rhydacite	U–Pb on zircon grains
879	16	Hanson *et al* 1994; Johnson *et al* 2007	Emplacement of Kafue rhyolite	U-Pb SHRIMP zircon
877	11	Armstrong *et al* 2005	Nchanga Red Granite A-type	U–Pb zircon of Nchanga granite
876	10	Johnson *et al* 2007	Kafue Rhyodacite Tuff	U–Pb on zircon grains
821	51	Muchez *et al* 2015	Disseminated Cu-Co sulphides in nodules and layers	Re–Os on Cu-Co sulphides
820	62	Muchez *et al* 2015	Disseminated Cu-Co sulphides in nodules and layers	Re–Os on Cu-Co sulphides
816	62	Barra (2005)	Disseminated and prefolding veinlet chalcopyrite and bornite at Konkola in COM and dolomites of Upper Roan Group	6 point isochron of Re-Os
787	26	Muchez *et al* 2015	Disseminated Cu-Co sulphides in nodules and layers	Re–Os on Cu-Co sulphides
765	5	Key *et al* 2001	Mwashya Group Lwawu lava mafic volcanic rocks	U–Pb SHRIMP zircon
753	8.6	Barron *et al* 2003	Upper Roan dating of geochemically similar gabbro sills	
745	7.8	Barron *et al* 2003	Upper Roan dating of geochemically similar gabbro sills in Solwezi area	
735	5	Key *et al* 2001	Mafic porphyries and breccias in contact with Grand Conglomerate at base of Nguba Group	U–Pb concordia
652	7.3	Decrée *et al* 2011	Uraninite in Luishia, Shinkolobwe, Swambo, Kalongwe	U–Pb discocrdia line with concordia intercepts
603	31	John *et al.* 2005	Recrystallized monazite of Luiswishi	U–Th–Pb on recrystallized monazite of Luiswishi
597	27	John *et al.* 2005	Recrystallized monazite of Luiswishi	U–Th–Pb on recrystallized monazite of Luiswishi
592	22	Rainaud *et al* 2005	Metamorphic growth monazite eclogite facies Zambian Copperbelt	U–Pb monazite
585	0.8	Rainaud *et al* 2005	Metamorphic growth biotite eclogite facies Zambian Copperbelt	^{40}Ar–^{39}Ar biotite
583	24	Barra *et al* (2004); Barra (2005)	Hypogene Cu-Co sulphide mineralisation - early orogenic cf. (Van Wilderode *et al.*, subm)	Five point Re–Os isochron age with analyses from the Nkana, Chibuluma and Nchanga deposits
573	5	Master *et al* 2005	Detrital muscovites in Biano Fm of Kundulungu Group in foreland	^{40}Ar–^{39}Ar muscovite

Age	Error	Authors	What	Dating technique

566	5	Hanson *et al* 1993	Synorogenic granites	U–Pb
559	18	Hanson *et al* 1993	Synorogenic granites	U–Pb
556	29	John *et al.* 2005	Recrystallized monazite of Luiswishi	U–Th–Pb on recrystallized monazite of Luiswishi
538	1.5	Hanson *et al* 1993	Post-orogenic rhyolite	U–Pb
548	7.6	Rainaud *et al* 2005	Monazites from Kalumbila, NW Zambia	U–Pb on monazites
532	2	John *et al* 2004	Whiteschist metamorphism in Kabombpo, Mwombezhi, Solwezi Domes	U–Pb on monazite grains
531	12	Rainaud *et al* 2005	HP talc-kyanite whiteschist	SHRIMP U–Pb metamorphic monazite
530	5.9	Decrée *et al* 2011	U-Pb mineralization at Nkana	$^{207}Pb/^{206}Pb$ ratio and concordant age
529	2	John *et al* 2004	Whiteschist metamorphism in Kabombpo, Mwombezhi, Solwezi Domes	U–Pb on monazite grains
526	3.4	Barra *et al* 2004	Mo from late chalcopyrite bearing veins	Re–Os
525	2	John *et al* 2004	Whiteschist metamorphism in Kabombpo, Mwombezhi, Solwezi Domes	U–Pb on monazite grains
512	17	Rainaud *et al* 2005	Regional pulse	SHRIMP U-Pb metamorphic monazite
		Cosi *et al* 1992; Torrealday *et al* 2000; Rainaud *et al* 2002, 2005; John *et al* 2004	Postorogenic cooling *510 to 463 Ma*	Ar–Ar biotite Rb/Sr muscovite and biotite
489.6	2.2	Sillitoe *et al* 2017	Upper limit of molybdenite ages from deposits and prospects in the Eastern Zambian Copperbelt	Re–Os on molybdenite
519.9	2.1	Sillitoe *et al* 2017	Lower limit of molybdenite ages from deposits and prospects in the Eastern Zambian Copperbelt	Re–Os on molybdenite

Table S1: Selection of ages of relevant tectono-metamorphic events in the Central African Copperbelt

Supplementary Material S2: List of studied boreholes and sections at Nkana-Mindola

This study (Torremans, field campaign 2012)

Several underground crosscuts and boreholes were studied at Nkana South ($n_{crosscuts}$ = 7, $n_{boreholes}$ = 8), Nkana Central ($n_{crosscuts}$ = 2, $n_{boreholes}$ = 2) and Mindola ($n_{crosscuts}$ = 2, $n_{boreholes}$ = 5) as well as the Nkana South open pit and Mindola Open pit. Boreholes at Mindola are always collared in the top of the Mindola Clastics Formation and drilled at 0° inclination through steeply inclined strata (60° – 80°). These boreholes are situated in different parts of the Mindola mine between 1274 m and 1541 m depth relative to the headgear of the shaft at Mindola and lie between two barren areas (Kitwe barren gap and North Shaft barren gap). Production boreholes at Nkana South and Central have variable inclination and a core diameter of 3.3 cm whereas those in Nkana Central and Mindola were 5 cm in diameter. All holes are semi-continuous with recovery > 90%.

- Nkana South Orebody (SOB) open pit
    - Structural mapping of two excavation levels of north-west-flank of open pit
- Nkana South Orebody (SOB)
    - Boreholes:
        - SE797 @ 2880L
        - SE800 @ 3140L +90°
        - SE801 @ 3220L
        - SE802 @3140L 1230S +90° vertical borehole
        - SE804 @ 3140L +10°
        - SE805 @ 3140L *c.* 70S XC +0°
        - NS0351 @ 3220L +2°, 331° azimuth
        - NS0352 @ 3220L +10°
    - Crosscuts:
        - 3460S X/C @ 2260L with pegs T2669 and T2667
        - 473N X/C @ 3220L with pegs T2605, T2601 and T2275
        - 190S X/C @ 3360L with peg T2642
        - 910 X/C @ 3290L with peg T2679
        - 1230S X/C @ 3140L
        - 35S X/C @ 3140L
        - 16S & 60 X/C @ 3140L
- Nkana Central shaft
    - Boreholes:
        - CE0680 100N X/C @ 3140L with +0° inclination
        - CE0675 100S X/C @ 600L with +30° inclination
    - Crosscuts:
        - 1450N XC @ 3280L
        - 480S decline @ 3140L
- Nkana Mindola
    - Boreholes:
        - ME1220 2170N X/C @ 4716Lwith 2.929° inclination 217.03° bearing with 84.0m length starting from 37611.514mN, 30470.539mE, -205.657m relative to sea level
        - ME1215 1270S X/C @ 5045L with 5.542° inclination bearing 210.541° with 45.0m length starting from 37102.707mN, 31074.402mE and -306.115m relative to sealevel.
        - ME1219 2980N X/C @ 4418L with 4.138° inclination and bearing of 212.732° and a length of 49.0m starting from 37587.338mN, 30343.410mE and -255.636m relative to sea level.
        - ME1221 3900S X/C @ 4370L 45,0m long 0.867° inclination 220°36’05” azimuth 36607.721mN 31661.337mE starting at -87.133m relative to sea level.
        - ME1224 5150N X/C @ 4180L with 0.504° inclination and bearing of 217°48’51” and length of 56.5m starting from 38141.523mN, 29728.732mE and -36.606m relative to sea level
    - Crosscuts:
        - 3900S #1 X/C @ 4370L

- 2630N #1 X/C @ 4716L

Ellen Clara, An De Cleyn (Muchez *et al.*, 2010)

- Borehole CE570 3660N X/C @ 3760L with +2° inclination 270°azimuth 12°49'43.413"S and 28°11'27.846"E and 113.95 m above sea level with EOH at 484m.
- Borehole CE555 3660N X/C @ 3760L with +4.2° inclination 281.84° azimuth 12°49'43.413"S and 28°11'27.846"E and 113.95 m above sea level with EOH at 292.5m.

Dieter Brems (Brems *et al.*, 2009)

- Crosscuts 90, 162, 794 and 1125 on 3360L
- Petrographic study on NS0168 +0° incl. 3360L, 400.5m NE direction starting from 31690.219N, 33375.967E or 12°51'5.072"S, 28°1151.460"E and 246.699m above sea level.

Supplementary Material S3: Orientation and statistical distribution data

Outcrop	Attitude (mean)	Data	n	β-girdle	π-axis	Shape (K)	Strength (C)
Nkana all own data	230/75	S_0-S_1	226	139/85	319/05	2.48	2.27
Nkana all own + Clara (Clara 2009)	229/73	S_0-S_1	241	139/90	319/00	2.16	2.19
Nkana all own	229/89	S_2	75			2.51	3.05
Section 1 (MMOP; Clara (Clara 2009)***)***	213/43	S_0-S_1	15			7.07	4.99
Section 2 (Mindola 2630N X/C)	244/60	S_0-S_1	5			3.82	7.03
Section 3 (Mindola 3900S X/C)	052/85	S_0-S_1	7			1.31	7.34
Section 4 (Central 480S decline)	243/76	S_0-S_1	14		328/21	1.23	3.30
Section 5 (Central 1450N X/C)	258/78	S_0-S_1	23		346/08	4.35	2.10
	066/88	S_2	12		349/81	2.20	3.79
Section 6 (South 910N X/C)	223/78	S_0-S_1	31		313/01	7.26	2.32
	050/83	S_2	20		321/08	1.74	3.51
Section 7 (South 473N X/C)	041/80	S_0-S_1	26		130/08	1.13	2.80
	311/80	S_2	8		316/67	1.17	2.93
Section 8 (South open pit)							
zone 1	227/64	S_0-S_1	15				
zone 2	220/81	S_0-S_1	17				
zone 3	225/69	S_0-S_1	8				
zone 4	236/56	S_0-S_1	4				
zone 5	239/47	S_0-S_1	5				
zone 6	237/61	S_0-S_1	26				
zone 1 & 2	223/71	S_0-S_1	32	131/83	311/07	0.69	3.7
zone 2 & 3	222/75	S_0-S_1	25	130/82	310/08	0.65	3.89
zone 3 & 4	228/64	S_0-S_1	12				
zone 4 & 5	239/51	S_0-S_1	9	145/87	325/03	1.48	3.85
zone 5 & 6	237/59	S_0-S_1	31	333/81	153/09	1.01	3.08
zone 4, 5 & 6	237/58	S_0-S_1	35	333/80	153/10	1.14	3.15
South open pit fold train	230/64	S_0-S_1	75	138/87	318/03	1.29	2.96
South open pit fold train	218/84	S_2	24	218/84			
South open pit fold train	299/08	L_i (S_1/S_2)	14				
Section 9 (South 16S-70S X/C)	312/00	S_0-S_1	10	132/90	312/00	0.88	4.16
Section 10 (South 190S X/C)	234/85	S_0-S_1	17		312/66	2.80	2.87
Section 11 (South 1230S X/C)	223/56	S_0-S_1	12		288/33	3.79	3.17
Section 12 (South 3460S X/C)	216/82	S_0-S_1	15		296/51	2.81	3.94

Table S2. Orientation summary data and statistical distribution data for sections at Nkana (cf. Woodcock & Naylor 1983). Location of sections is indicated in Fig. 4. MMOP is Mindola Open Pit; X/C is mine crosscut. The π-axis-to-S_1-cleavage and β-girdle of the S_1-cleavage are only shown where relevant.