Revised grade and tonnage model of carbonatite deposits

by

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COMMENTS This model applies to the descriptive model of carbonatite deposits (No. 10) by Singer (1986a) and should replace the grade and tonnage model in that volume (Singer, 1986b). Data used in this model are presented in Table 1. In some cases, other estimates of grades or tonnages were available, but their quality was questionable and so they were not used here.

Figure 1 presents a plot of the tonnages of these deposits. Figures 2 and 3 present plots of the niobium and rare-earth grades respectively. In each figure the cumulative proportion of deposits versus the tonnage or grade of the deposits is plotted. Individual symbols represent the deposits. In Figure 4 tonnage is plotted against both niobium and rare-earth grades. This plot demonstrates the lack of correlations among these variables and the lack of any distinct groupings of these deposits. Locally these carbonatite complexes may contain economically interesting grades of uranium, thorium, titanium, iron, copper, vermiculite, zirconium or phosphorus; frequently, these other commodities are in different zones than the niobium or rare-earth-rich parts of the complex. In addition, adjacent deposits can be either niobium or rare-earth rich, such as at Catalao I and Catalao II.

References used for data sources


Schobbenhaus, Carlos, and Silva Coelho, Eduardo, eds., 1986, Principais depositos minerais do Brazil: Vol. II: Ferro e metais da industria do aco: Ministério das Minas e Energia, Brazil, 501 p. (in Portuguese)


Table 1. Grades and tonnages of carbonatite deposits.
(Tonnages in millions of metric tons, niobium, rare-earth, and phosphate grades in percent of $X_2O_3$. Zero indicates no grade reported. Location codes: BRZL Brazil, BURN Burnai, CINA China, CNON Canada British Colombia, CNON Canada Ontario, CNQU Canada Quebec, INDA India, KNYA Kenya, MLWI Malawi, MNGI Mongolia, NAMBI Namibia, NRWY Norway, SAFR South Africa, TNZN Tanzania, UGND Uganda, USCA United States California, USCO United States Colorado, ZIRE Zaire)

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<th>DEPOSIT</th>
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<th>RE_2O_5 grade %</th>
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Figure 1--Tonnages of carbonatite deposits.
Figure 2--Niobium grades of carbonatite deposits.
Figure 3--Rare-earth grades of carbonatite deposits.
Figure 4--Niobium and rare-earth grades versus tonnages of carbonatite deposits.