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δ^{30}Si *versus* Ge/Si evidence necessitates quartz-rich metabasaltic sources for Na- and K-rich Archean granitoids from Zimbabwe

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Na-rich granitoids (Tonalite-Trondhjemite-Granodiorite, TTG suite) and less K-rich granites are ubiquitous in Archean cratons. Both present heavier δ^{30}Si [1,2] and much lower Ge/Si ratios [3] compared to post-Archean counterparts. These anomalies have been proposed to trace modal quartz and seawater-derived heavy silicon in the metabasaltic source of trondhjemitic and granitic melts intruded as batholiths in the Kaapvaal craton [3]. Here we extend our δ^{30}Si and Ge/Si database to 3.6-2.9 Ga grey gneisses from the Zimbabwe craton.

We find no resolvable δ^{30}Si and Ge/Si differences between tonalitic, granodioritic, trondhjemitic and granitic gneisses. All together (δ^{30}Si =–0.10±0.03‰, ±2SE for n=16), they are lighter than Kaapvaal granitoids (δ^{30}Si = -0.02±0.02‰, ±2SE for n=37), but still significantly heavier than Phanerozoic I- and A-type granites (δ^{30}Si =–0.19±0.02‰). Their average Ge/Si (1.14±0.11 micromol/mol ±2SE) is identical to those measured from the Kaapvaal TTG and granitic plutons (1.15±0.10, 1.13±0.11 micromol/mol, respectively [3]), but strongly differs from Ge/Si of average continental crust (1.80 mmol/mol) and post-Archean granitoids (1.64<Ge/Si<2.10 micromol/mol [3]).

As quartz is the most Ge-depleted major phase (0.4<Ge/Si<0.6, [3,4]), we suggest that metabasaltic sources of all studied Na and K-rich granitoids might have incorporated large proportions of normative quartz but variable contribution of seawater-derived silica (δ^{30}Si>0) during seafloor alteration. Since any large modal quartz fraction present during amphibolite dehydration melting is known to significantly increase felsic melt fractions and decrease their liquidus temperatures [5], this factor should have facilitated amphibolite melting without the need of adding free water to form the prominent Paleoarchean TTG suites and their associated K granites.

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