

Interactive comment on “Mafic granulite xenoliths in the Chilka Lake suite, Eastern Ghats Belt, India: evidence of deep-subduction of residual oceanic crust” by S. Bhattacharya et al.

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General comments

This paper reports chemical and isotopic data from a suite of mafic granulite enclaves with model ages of 1.9 Ga within charnockite host rocks in the Eastern Ghats granulite belt. The mafic granulites have compositions similar to those of ocean-island basalts and are interpreted as xenoliths. The authors use the data to infer an OIB origin for the rocks, and go so far as to speculate on the origin of the inferred OIB protolith through the recycling of oceanic crust in a previous subduction event represented by hornblende-bearing granulite xenoliths with model ages of 2.5 Ga occurring elsewhere

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in the Eastern Ghats. In my opinion the paper is not publishable because it is largely an over-interpretation of the data and so the conclusions have no validity.

Specific comments

1. The mafic granulite bodies are enclaves in more felsic granulites. They are not xenoliths in the generally accepted meaning of the word. The authors even acknowledge this on page 1389, lines 1-4, where they state that the charnockite host rocks and their mafic enclaves have a melt-restite relationship. This being so, there is little likelihood that the mafic granulites will have preserved much of their original composition. 2. Basalt with OIB-like composition is found in non-oceanic environments (e.g. large igneous provinces and continental rift systems). 3. The age inferences for the two suites of mafic granulites are based on model ages with respect to a depleted mantle source and have little geochronological significance.

Technical corrections

There are many typographic errors in the paper and so I shall only list the more significant errors. Page 1380, line 3 and elsewhere: pyroxenite, not pyroxinite. Page 1380, line 6 and elsewhere: ocean-island basalt (no need for upper case). Page 1380, lines 15 and 16: need to specify that the numbers refer to isotope ratios. Page 1382, lines 8-11: this sentence doesn't make sense to me. Page 1384, lines 7-11: instrument names don't need upper case initial letters. Page 1384, line 23: AGV-2. Page 1385, lines 17-19: define CN/CNK and Mg#. Page 1386, line 4: define Niggli alk. Page 1386, line 19: what does "...with biotite-melting and coexisting with charnockite melt..." mean? Page 1386, line 28: is Ni really measured with 2-decimal place precision? Page 1388, line 12: what do these CHUR values mean? 0.513151 is neither the initial nor present-day value of CHUR. Page 1391, line 18: define GLOSS. Figure 4: the figure needs more explanation. What is the circled area? What is the significance of the arrow pointing to "Primitive basaltic magma"? Primitive basaltic magma does not have SiO₂/Al₂O₃ around 1. Figures 7 and 9: what is the source of these figures? The axes and text are

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difficult to read. In any case, trying to relate the composition of the enclaves to specific OIB end members is futile.

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