

Interactive comment on “Jurassic–Paleogene intra-oceanic magmatic evolution of the Ankara Mélange, North-Central Anatolia, Turkey” by E. Sarifakioglu et al.

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General comments: This manuscript presents an excellent summary of the evolutionary history of the well known, and one of the world’s classical melanges, the Ankara Melange. It contains all expected topics for providing a complete picture of this very interesting rock complex, i.e. from detailed geological maps, field observations, documentation and detailed description of the various rock components, a complete analytical treatment of the components (age dating, major and trace element analyses, and several isotope systems). The geochemical analyses of the various magmatic rocks (and of different ages) have been treated in both classical and present-day ways of

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diagram-presentations, and their genesis discussed in terms of mantle processes, in particular related to the source characteristics above subduction zones. Finally, on the basis of the very robust data presentation and discussion, a sound tectonic model is presented. The paper is well organized, clearly written, and in general easy to follow from start to end. By reading the abstract alone, the reader gets a clear view of this rather complex rock association, the Ankara melange. I enjoyed reading the paper, and strongly support it being published.

Specific comments:

1. In the Introduction I expected to see a short historical overview of previous research on the Ankara Melange.
2. On section “2. Regional geology”, define CACC, even though it is obvious that it stands for Central Anatolian Crystalline Complex. It is in fact done at the very end of the discussion, but should be defined when first used. Further, the term “Sakarya Continent” should preferably have been shown on the map of Fig. 1 (it is shown on Fig. 20). It is referred to as “The Sakarya Continent in the Pontides represents the southern margin of Eurasia (Figs. 1 and 2)”.
3. On section “3. Internal structure and ...” many components and terms are presented. For the reader unfamiliar with the complexity of this chaotic deposit, it would have helped with the presentation of a generalized tectonostratigraphic column.
4. For the section “5. Analytical methods” explain what is meant by “J values” (page 1950, line 11). Also, explain “n x10⁻¹⁰ cc STP” (Page 1959, line 15).
5. Section “6. Geochemistry”. Under “6.1. Oceanic basaltic rocks” (page 1951, line 16) you write: “. . .alkaline lavas that crosscut. . .”. How can a lava flow crosscut? Further (page 1953, lines 3-4), “. . the oceanic basalts have Nb/Y values characteristic of island arc rocks”. This appears a little confusing. These rocks are described under “oceanic basaltic rocks”, but categorized as island arc rocks. Why are they not placed

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under the next section "6.2. Island arc rocks"?

6. Subsection 6.2. Island arc rocks (page 1953, line 5). Are lamprophyres in general really characteristic rocks of island arc magmatism? The whole association of picrobasalt, trachybasalt, trachyandesite, tephrite and phonotephrite, i.e. a suite of alkaline magmatic rocks, would rather make me think of oceanic island magmatism. I appreciate that the geochemical plots indicate a subduction-related environment, but I think this particular case would need some more discussion. In this connection I would suggest looking into the lamprophyre literature, and some of the classical papers by Nicholas M.S. Rock. I suggest reading and referring to papers such as: Rock, N.M.S. 1977. The nature and origin of lamprophyres: some definitions, distinctions, and derivations. *Earth-Science Reviews* 13, 123-169. Another useful paper is: Rock, N.M.S. 1984. Nature and origin of calc-alkaline lamprophyres: minettes, vogesites, kersantites and spessartites. *Transactions of the Royal Society of Edinburgh: Earth Sciences* 74, 193-227.

Best regards and good luck with the revision (minor) of the paper

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