

Interactive comment on “Deciphering the metamorphic evolution of the Pulo do Lobo metasedimentary belt (SW Iberian Variscides)” by Irene Pérez-Cáceres et al.

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Reply to the interactive comment of referee#2 on the paper entitled “Deciphering the metamorphic evolution of the Pulo do Lobo metasedimentary belt (SW Iberian Variscides)” by Irene Pérez-Cáceres et al. (Manuscript number se-2019-143).

1. General comments: We acknowledge the revision and positive comments of the anonymous referee 2. We also appreciate his/her constructive suggestions, which have contributed to improve the revised version of the manuscript.
2. Specific comments: All of the suggestions and corrections have been attended,

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as explained below point-by-point (line numbers in brackets correspond to the revised version of the manuscript with tracked changes (uploaded as supplement file to this response): Lines 48-49: the range of celadonite content and average data of b-cell dimension have been included in the abstract (lines 49-50 in the revised manuscript) and in the second paragraph of section 4.2 (lines 426, 431-432). As for the keywords, “X-Ray diffraction” has been substituted by “Illite crystallinity”. Line 100 (103): “allows to know” instead of “allows know”, as suggested. In lines 163, 167 and 181 (174, 178, 192), “which” has been included after each formation is named, since these sentences are subordinated. Line 228 (244-245): “SEM” has been changed to “scanning electron microscope (SEM)”, because this is the first time that is mentioned. Line 276 (292-293): we refer here to the temperature of formation of white-mica, and it has been included according to the suggestion made by the referee. Lines 292-294 (308-310): minerals and synthetic oxides have been rewritten with lowercases in the revised version. Lines 318-321 (lines 337-339): regarding the EPMA analysis at the University of Huelva, information about the standards used and the analysis time has been incorporated in section 3.2. Lines 324-330 (342-348 in the revised version) have been shortened following the referee’s suggestion. In addition, “carbonaceous material” has been abbreviated to “CM”. Lines 341-344 (360-361): we have included justification of sample rejection for analysis. Line 349 (368): “equipped” instead of “equiped”. Line 361 (379): “Acording to SEM analysis” has been replaced by “According to the petrographic study”. Line 369-370 (lines 387-388): The last sentence in the introduction to section 4 has been deleted, as suggested. Line 373 (391): “of K-white mica” has been included. Lines 374-376: The referee suggests adding a column in Table 1 with the KI values corresponding to the bulk fraction of the samples. Actually, this column was already included in the first version. Lines 393-394 (411-412 of the revised manuscript): we agree with the referee comment. “very low to” and “presence of C/S and” have been deleted according to the referee’s correction. Line 395 (413-414): we have specifically clarified the term “low-pressure gradient” according to Guidotti and Sassi (1986). Also clarified at the end of the abstract (“low pressure/temperature gradient”; line 51). Line

409 (428): “illite” has been replaced by “illitic-mica”. Line 412 (431-432): the values of low b-cell parameter and high d001 have been indicated. Lines 419-420 (438-439): an assertion and reference have been incorporated to justify why poor-sudoite chlorites are related to higher temperatures. Line 444 (463): the average temperature range has been revised. Line 445-447 (465-467): the sentence “Nevertheless, the Bourdelle thermometer predicts temperatures up to 380-400°C” has been deleted because it is not significant as the referee explains. Other writing suggestions have also been taken into account. Line 455 (476): Fig. 3 is now cited here. Line 469 (489-492): the sentence has been changed as the referee suggests. Lines 471-473 (492-494): location of Table 2: the last sentence of the first paragraph in section 5.1 has been moved to section 5.3 (600-602) as the referee suggests. Line 481 (502): “our” has been substituted by “these”. Line 498 (520-521): according to Abad et al. (2006), the KI value $0.14 \Delta^2\theta$ is the limit of high epizone conditions. Line 512 (535-536): temperature ranges have been revised, giving the overall range based on the three approaches. Line 513 (537): Fig. 4d is cited now. Line 529 (552): “is difficult” has been substituted by “is really difficult”. Lines 531-532 (554-555): “white mica crystallinity and” has been deleted according to the referee’s revision. Lines 554-561 (597-604): In these sentences, there are some references on how igneous bodies (especially dykes or plutons) can influence the CM temperatures. The referee asks whether or not dykes really crop out in the studied area. As stated some lines above in the text (and in the geological description), the Pulo do Lobo contains layered mafic intrusions and some granitic plutons that could have enhanced the CM temperature in some samples (eg., sample PLB-93; see also lines 514-519 of the first version). Line 567 (593): potassium feldspar (Fsp) has been incorporated. Figure 1 caption (687): “and collected samples” has been added. Figure 7: the referee asks why the width of the columns in Fig. 7a and Fig. 7b are different; the software used unfortunately does not allow changing it. Table 1 and Figure 1: colour bar: The colour bars (“cold” to “hot” colours as temperature increases) have the only purpose of visual appearance of relative temperatures. To avoid confusion, different coloured bars were used for KI (from green to orange) and

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RSCM (from blue to red) parameters. Table 1 caption: “Basel” has been incorporated to “KI values” (732). “Feldespar” has been substituted by “Feldspar” (734). Table 1: the number of decimals are now equal. “KI colour” of sample 82 has been corrected.

References in this reply: Abad, I., Nieto, F., Gutiérrez-Alonso, G., Campo, M. D., López-Munguira, A., and Velilla, N.: Illitic substitution in micas of very low-grade metamorphic clastic rocks. *European Journal of Mineralogy*, 18(1), 59-69, 2006. Guidotti, C.V., and Sassi, F.P.: Classification and correlation of metamorphic facies series by means of muscovite b data from low-grade metapelites, *Neues Jahrbuch für Mineralogie-Abhandlungen*, 153, 363-380, 1986.

Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2019-143/se-2019-143-AC2-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-143>, 2019.

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