

Interactive comment on “Characterization of three new condensation particle counters for sub-3 nm particle detection: ADI versatile water CPC, TSI 3777 nano enhancer and boosted TSI 3010” by Juha Kangasluoma et al.

Anonymous Referee #3

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General comments:

This manuscript describes some calibration and comparisons performed with 3 CPCs, chosen for their abilities to measure particle sizes below 3 nm. Good performance data on CPCs is critical for interpreting their measurements. As such, the manuscript would make a contribution in this area. I have two main concerns and a number of minor suggestions.

Main concern 1: Overall the manuscript is fairly easy to follow but there are times when I feel it could benefit greatly from a careful review for English grammar and typographic

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errors.

Main concern 2: As described specifically below, the paper often reads like a random collection of data from lab experiments and the reader is not told why these experiments were chosen, why some experiments were performed on one instrument and not another, etc. The authors should address this early in the manuscript to allow the reader to make better use of these observations.

Minor edits/questions/comments:

49: I believe that Brechtel began commercialization of their mixing-type CPC before 2011, so this statement should be modified to “the use of a mixing CPC for a booster” or some-such.

100: correct typo “pm”

108 and 124: state activity of the radioactive source

127: “cheap second hand” seems rather up to interpretation . . . I could argue that even used CPCs are not “cheap” and it’s unclear how the fact that this CPC was “second hand” impacts its performance. Please consider rephrasing.

137: details -> detail

154: why was the line length made half that of the other CPCs “for the same reason”?

155: It is sometimes difficult to understand why the authors chose the parameter space for operating the instruments in the way they did. For example, why did the authors decide to measure just the 3777 at different dew points? Also why was the sample flow rate only changed on the B3010? Also why were both of the above two issues mentioned in the section devoted to aerosol generation? [Note: I now realize that an explanation for the dew point is provided in line 265. I suggest having such a sentence earlier in the paper so the reader better understands the experimental parameters.

175: insert “source” after radioactive?

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184: remove “being” or replace with “currently”

243, 261: Awkward and possibly grammatically incorrect sentences ... please rephrase.

292: Similar to the criticism of line 155, why was concentration dependence calibration performed only for the v-WCPC? Could it not also be an important factor for the other CPCs?

342: show -> shown

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