

## ***Interactive comment on “Oxygen isotopic signature of CO<sub>2</sub> from combustion processes” by M. Schumacher et al.***

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Response to the comments of the referees, ACP-2008-424 final response

The authors are grateful for the detailed reviews and the ideas and suggestions for further improvement. We have largely revised the manuscript, based on the comments, and hope it will now be rated suitable for publication in ACP.

Much to our regret the revision took extraordinarily long, mainly caused by the long-time stay of the first author at the arctic research station on Svalbard.

As we believe we addressed and implemented virtually all suggestions, remarks and requirements in the latest version of the manuscript, we do not go through all of them one by one in our response.

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a) Thought has been given to the stylistic suggestions (comments from the editor pp. 18995, 18996, 18998, 19001, 19003, 19008, 19010, 19015, . . . , III).

b) We now present the hypothesis, methods and results in a more pronounced way by deletion of redundant or not essential sections (e.g. comment I, p. 18999 / c) and by the adaptation of figures and tables (comments of the editor and the anonymous referee). We redesigned Figure 2 completely (comments of the editor and the anonymous referee), set up one new table (taking the comment II of the anonymous referee into account) and an additional figure (comment k).

c) Clearer expressions were chosen to follow the comments on sentences on pp. 18994/15, 18995 (a), (d), 19016/4, 19016/12, 19017, 19018, 19020/20. Chapter 2.2 was enhanced by a last paragraph in response to comment II of the anonymous referee.

d) p. 19001: An effect of the salt fraction in the water, used for the study on wet material, was not investigated. Since all samples were treated in the same way, an influence due to evaporation can be neglected (because all samples were stored in closed cuvettes at 6°C), and because we are not using the data as comparison standards a specific study on the effect of dissolved salt seemed not to be mandatory.

e) We are aware of surface effects when freezing/thawing CO<sub>2</sub> in quartz glass containers (19002/9; Werner et al.; Extraction of CO<sub>2</sub> from air samples for isotopic analysis and limits to ultra high precision  $\delta^{18}\text{O}$  determination in CO<sub>2</sub> gas, Rapid Commun. Mass Spectrom., 15, 2152 – 2167, 2001). As compared to the cited study the gas amount : surface ratio in our experiments has been more favourable. The glass had been baked at high temperatures during preliminary combustion experiments and was only applied for the actual combustion (i.e. not for freezing CO<sub>2</sub>). We assume possible glass surface effects to be smaller than the natural variability of the samples, or the effects resulting from different combustion modes.

f) pp. 19004/6: In accordance with the comment of the anonymous referee to shorten

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the text we also think that some information might be too specific to be included in the text. The samples were normalized with benzoic acid and dimethoxy-benzoic-acid as references and trimethoxy-benzoic acid as internal quality control standard.

g) The miscalculated value on pp. 19011/18 was corrected and the other values checked for failures.

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