

Interactive comment on “Current estimates of K_1^* and K_2^* appear inconsistent with measured CO_2 system parameters in cold oceanic regions” by Olivier Sulpis et al.

Anonymous Referee #2

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General Comments: This clearly-written article is based on a sound analysis of GLO-DAPv2 and SOCAT data that reveals large discrepancies between the temperature and salinity dependence of published carbonic acid stoichiometric dissociation constants and relationships estimated from available data. These discrepancies are particularly extreme at cold temperatures and thus have enormous implications for understanding of carbon cycling and ocean acidification in high latitude ocean regions. This study further suggests that the uncertainty for carbonic acid dissociation constants at cold temperatures is more substantial than previous studies indicate and that the potential for bias in estimation of pCO_2 from other carbonate system parameters is not well constrained. The factors that contribute to the inconsistencies between studies are

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beyond the scope of the study and highlight a need for future studies based on contemporaneous in situ measurements of all four carbonate system parameters as well as laboratory studies.

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