Supplement of:

Measurement report: Observation-based formaldehyde production rates and their relation to OH reactivity around the Arabian Peninsula

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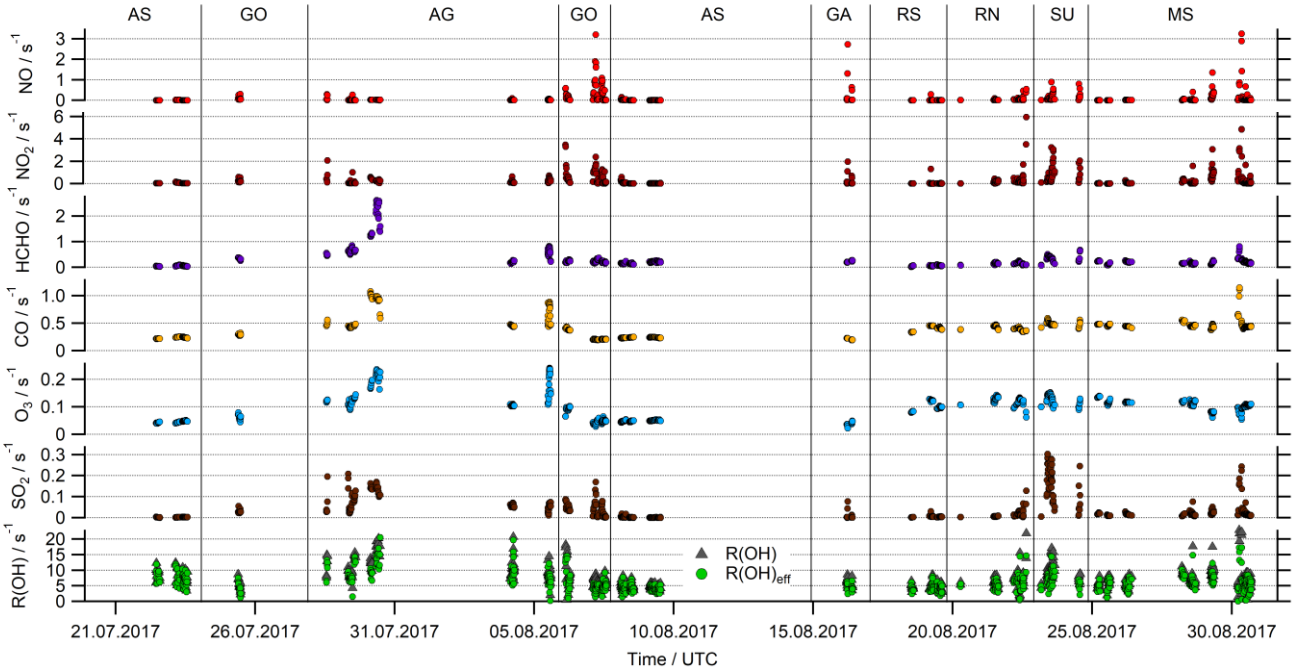

Figure S1: Timelines of the contribution of inorganic compounds (NO, NO_2, SO_2, O_3) and further reactants (CO, HCHO) to total R(OH). Subtraction of the non-HCHO yielding reactants from R(OH) yielded the effective OH reactivity $R(OH)_{eff}$.

Table S1: Trace gases used for calculating the effective OH reactivity ($R(OH)_{eff}$) with IUPAC preferred values for their reaction constants.

Compound	K_{M+OH} [cm³ molecules^{-1}s^{-1}]	Max. OH reactivity during AQABA (Pfannerstill et al. 2019)
NO	9.70E-12	29.3
NO_2	9.80E-12	6.94
O_3	7.30E-14	0.26
SO_2	9.30E-13	0.33
CO	1.44E-13	1.16
HCHO	8.50E-12	2.33

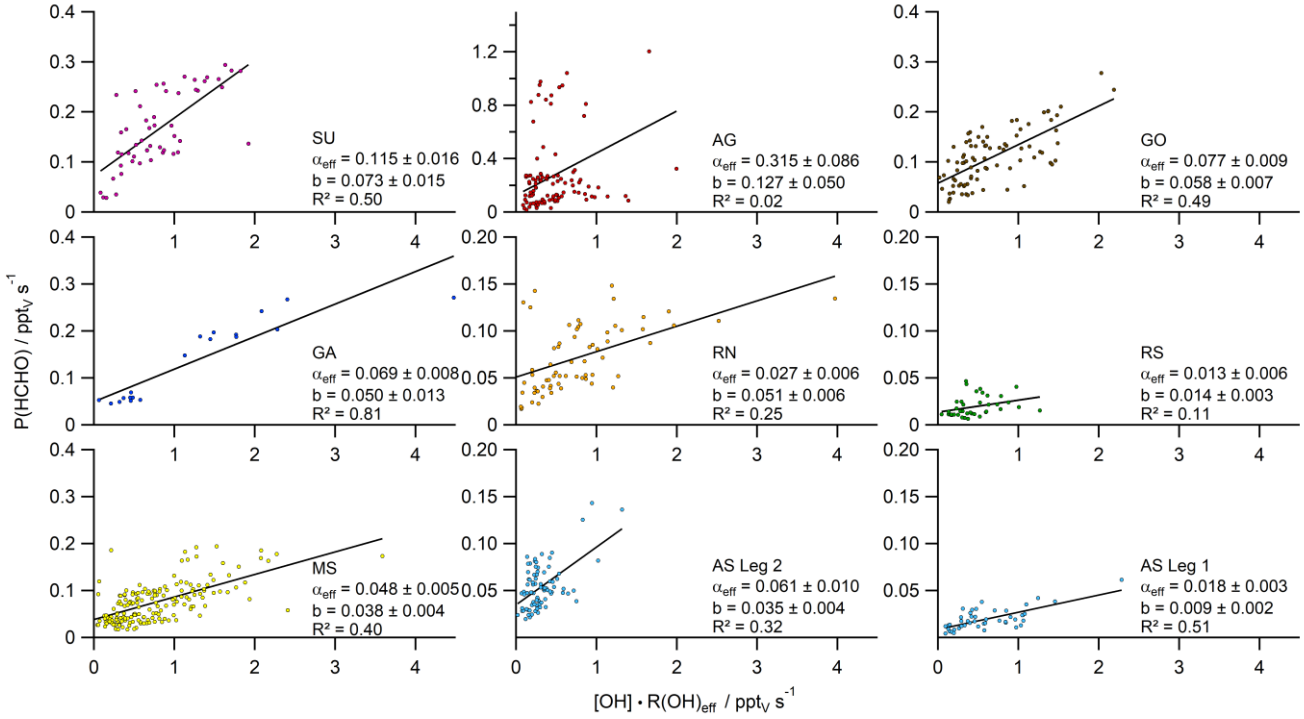

Figure S2: Scatter plots with bivariate fits (York et al., 2004) of the product [OH] × $R(OH)_{eff}$ versus the HCHO production rate, subdivided into the different regions probed during the AQABA cruise. The HCHO yield α_{eff} is the slope of the respective regression, while the intercept represents additional HCHO sources not related to OH chemistry ($P_{add}(HCHO)$).

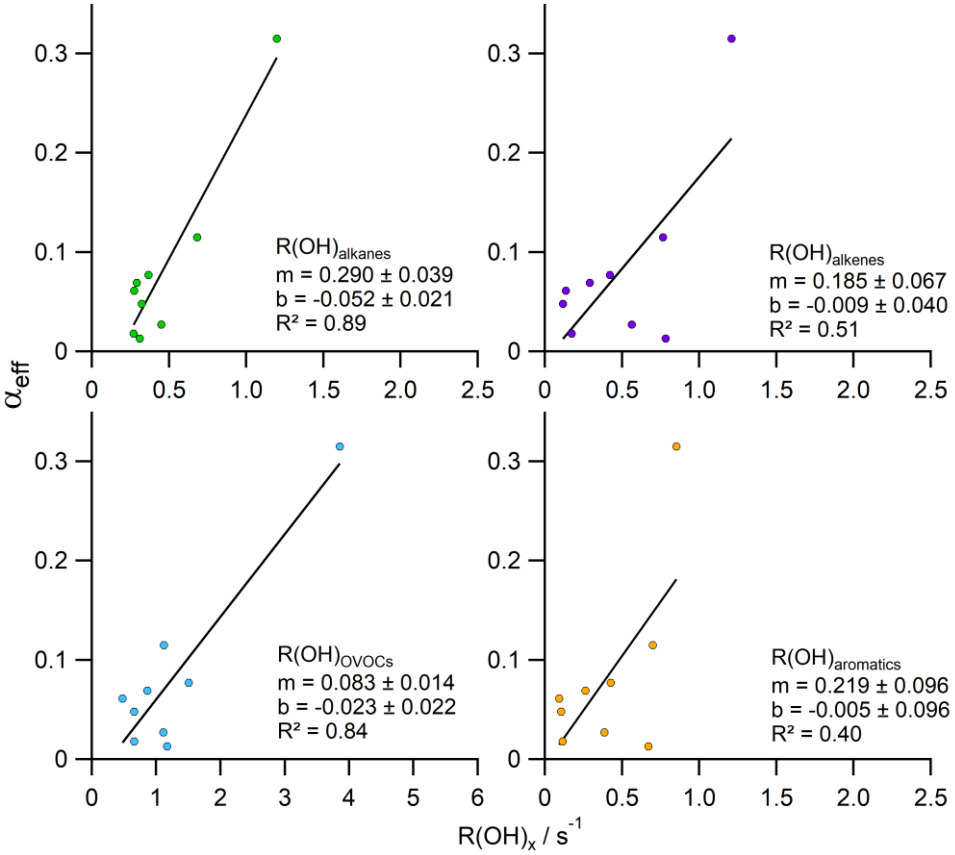

Figure S3: Scatter plots of the HCHO yield α_{eff} (calculated with $R(OH)_{eff}$ via Eq. 1) as a function of the separated OH reactivity ($R(OH)_x$) towards different VOC families (aromatics, alkanes, alkenes, and oxidized volatile organic compounds).