

Interactive comment on “Isoprene oxidation mechanisms: measurements and modelling of OH and HO₂ over a South-East Asian tropical rainforest during the OP3 field campaign” by D. Stone et al.

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- **Concerning page 10362, line 15: "A simple, but chemically unlikely, recycling scheme in which OH is produced directly by isoprene+OH (C₅H₈ + OH → ISOPO₂ + n OH) was investigated as one explanation for the model discrepancy found for the GABRIEL campaign (Kubistin et al., 2010). The best fit between the observation and the model required n = 1.3 (Kubistin et al., 2010). However, the mechanism for recycling was not specified."**

Kubistin et al., 2010, is cited to have introduced the reaction C₅H₈ + OH →
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ISOPO₂ + OH for the GABRIEL campaign as an explanation for a direct additional OH recycling. This is misleading as this reaction was chosen only to investigate a possible OH recycling inside the whole isoprene oxidation scheme. This sole reaction should only be understood as a proxy for additional recycling within the subsequent oxidation scheme. The factor n = 1.3 shows that at some point or points within the oxidation process a total of 1.3 OH have to be produced for each OH destroyed in the initial step.

- **Concerning page 10363, line 2: "Our optimal value of n = 3 is significantly higher than the values found in the GABRIEL study (n = 1.3, Kubistin et al., 2010). However, details of how this value was derived by Kubistin et al. are not provided."**

The factor n in the reaction C₅H₈ + OH → ISOPO₂ + n OH was determined by Kubistin et al. for the GABRIEL campaign by modifying the reaction C₅H₈ + OH → ISOPO₂ to C₅H₈ + OH → ISOPO₂ + n OH inside the chemical reaction scheme. The reaction constant used was $k = 2.54 \cdot 10^{-11} e^{\frac{410}{T}}$. By varying the factor n in the range of 1.0 to 1.5 (0.1 steps), best agreement between observed and modelled OH concentrations during GABRIEL was obtained with the factor n = 1.3 (OH_{obs} / OH_{mod} = 1.4 ± 0.5).