Supporting Information

Annex I: Percent change in SOA concentrations and composition

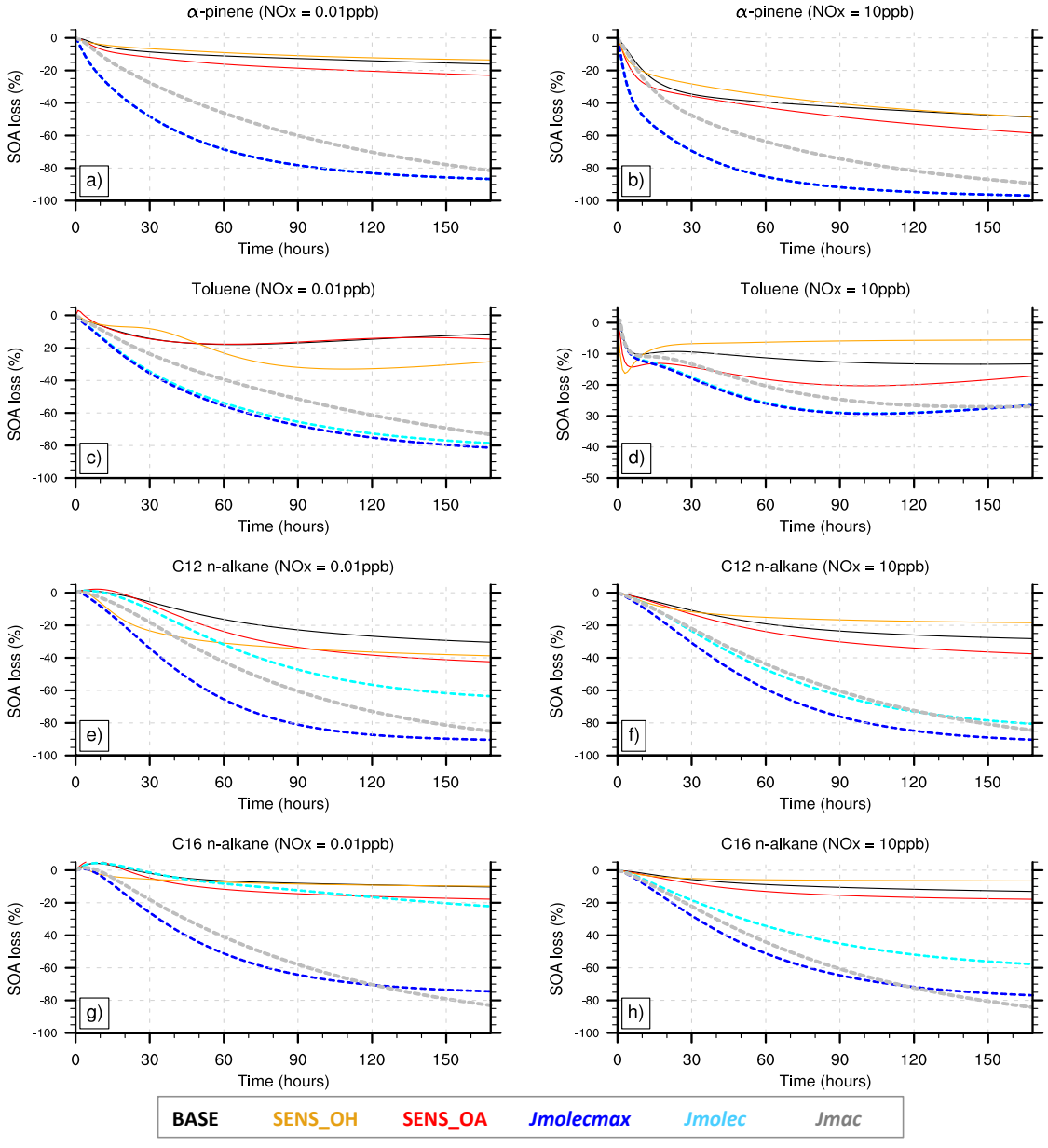


Figure SI-1: Percent change in SOA concentrations due to photolytic reactions in the gas phase (BASE, SENS_OH and SENS_OA runs) and in the condensed phase (J_{molec}, $J_{molecmax}$ and J_{mac} runs). These simulations are all compared to the reference BASE dark simulation.

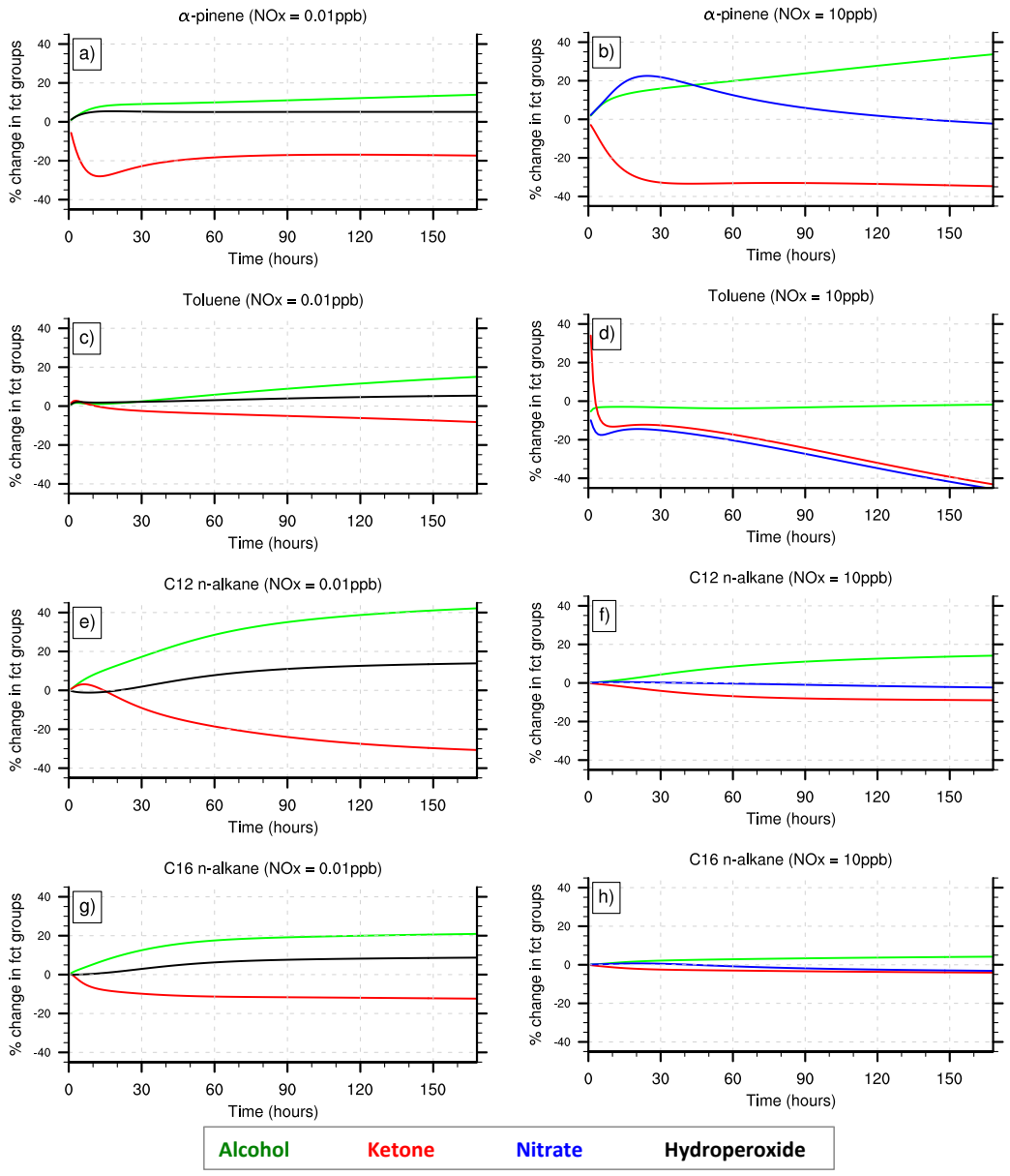
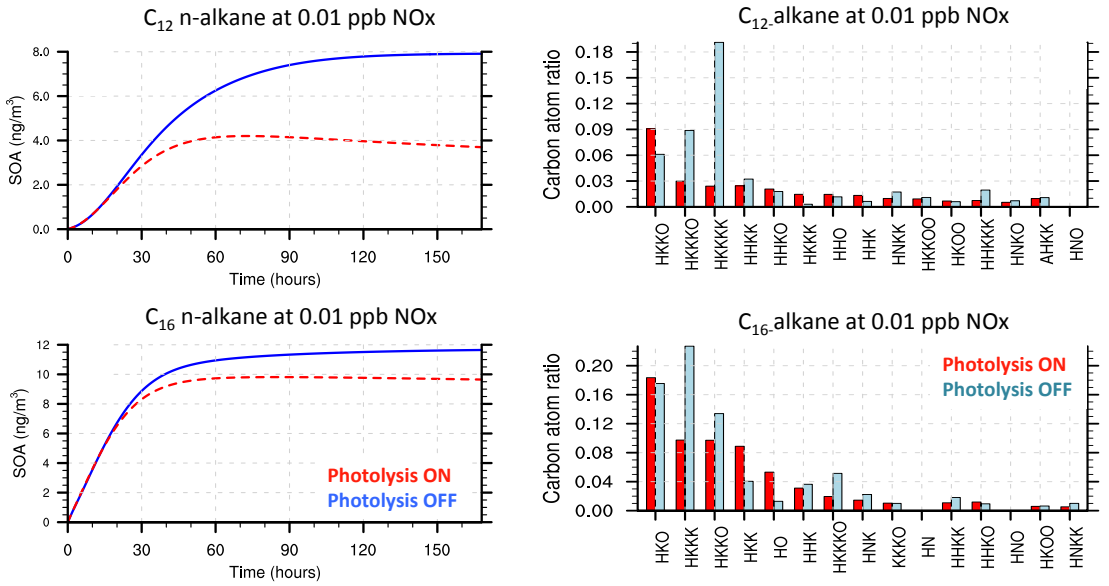


Figure SI-2: Percent change in functional groups (# per carbon) found in the particle phase due to gas-phase photolytic reactions of organic compounds. Results are for the BASE run, and the percentage represents ($J_{ON} - J_{OFF}$)/ J_{OFF}. Functional groups which absolute values are close to zero are not shown (e.g. nitrate at low NOx, hydroperoxides at high NOx, and aldehydes).

Annex II: Choice of hydroperoxide rate constant



A = acid; H = hydroperoxide; K = ketone; N = nitrate; O = hydroxy

Figure SI-3: Sensitivity of the results to the choice of the hydroperoxide rate constant at low NOx conditions for C_{12} and C_{16} n-alkane precursors. Sensitivity simulations are similar to the BASE case run, except that the rate for abstracting the H in -OOH in hydroperoxides was changed to 14 (which was the default value used in GECKO-A up to now (*Aumont et al., 2005*)). In the BASE case simulation (and throughout this paper) the used value is 3.5.