Measurements of *in-situ* SOA Formation Using an Oxidation Flow Reactor at GoAmazon2014/5

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During GoAmazon2014/5, ambient air was exposed to controlled concentrations of OH or O_3 *in-situ* using an oxidation flow reactor (OFR). Oxidation ranged from hours–several weeks of aging. Oxidized air was sampled by several instruments (e.g., HR-AMS, ACSM, PTR-TOF-MS, SMPS, CCN) at both the T3 site (IOP1: Feb 1–Mar 31, 2014, and IOP2: Aug 15–Oct 15, 2014) and T2 site (between IOPs and into 2nd IOP). Oxidation of ambient air in the OFR led to significant and dynamic SOA formation. In general, more SOA was produced during the nighttime than daytime, and more in the dry season (IOP2) than wet season (IOP1). The maximum amount of SOA produced during nighttime from OH oxidation ranged from less than 1 μg/m^3 to greater than 10 μg/m^3. O_3 oxidation of ambient air also led to SOA formation, although much less than from OH oxidation. Preliminary PMF factor analysis showed that the less-oxidized OOA (LO-OOA) factor was produced at up to several days OH aging, while at longer ages the more-oxidized OOA (MO-OOA) factor was formed and LO-OOA was depleted. HOA, BBOA, and IEPOX-SOA factors were not formed in the reactor, just depleted at high ages (though at different rates). More detailed PMF results will be presented. Variations in the amount of SOA formation often, but not always, correlated with measured gas-phase biogenic and/or anthropogenic SOA precursors (e.g., SV-TAG sesquiterpenes, PTR-TOFMS aromatics, isoprene, and monoterpenes). The SOA mass formed in the OFR was ~10x larger than could be explained by aerosol yields of measured primary VOCs, suggesting that most SOA was formed from intermediate sources such as S/IVOCs (e.g., VOC oxidation products or evaporated POA), consistent with previous OFR field and lab studies. To verify the SOA yields of VOCs under OFR experimental conditions, atmospherically-relevant concentrations of several VOCs were

added individually into ambient air in the OFR and oxidized by OH or O_3. SOA yields were similar to published chamber yields.