

Airborne in-situ OH and HO₂ observations in the cloud-free troposphere and lower stratosphere during SUCCESS

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Abstract

The hydroxyl (OH) and hydroperoxyl (HO₂) radicals were measured in-situ in the troposphere and lower stratosphere with a new instrument aboard the NASA DC-8 aircraft during SUCCESS (April and May 1996). For 3 midday flights in mostly cloud-free air - 29 April, 10 May, and 15 May - OH mixing ratios were typically 0.1-0.5 pptv and HO₂ mixing ratios were typically 3-15 pptv from just above the planetary boundary layer to the lower stratosphere. Observations from 29 April and 15 May are in substantial agreement with photochemical model calculations; observations from 10 May are 1.5 to 3.5 times larger for much of the flight, as occurred on other flights in May. These differences exceed measurement uncertainties and may reflect HO_x sources and reactants not measured during SUCCESS.
