ABSTRACT

Four research flights on board the NASA DC-8 aircraft were sponsored by the California Air Resources Board (CARB) and carried out over California in June 2008. Among many other measurements, whole air samples were collected by the UC-Irvine (University of California, Irvine) research group in electropolished stainless steel canisters. Once filled, the canisters were shipped and analyzed at the UC-Irvine laboratory for a wide variety of volatile organic compounds (VOCs) including nonmethane hydrocarbons, halogenated species, alkyl nitrates, selected sulphur and oxygenated compounds.

We start with an overview of the VOC levels measured over California, and then focus on two different topics: CFC replacement compounds, and oxigenated species.

HCFCs and HFCs have been introduced as substitute of CFC compounds in response to the regulations imposed by the Montreal Protocol and subsequent amendments. While HCFCs still contribute to the destruction of the stratospheric ozone layer, the chlorine-free compound HFCs do not pose any treat to the ozone layer but are important greenhouse gases enhancing radiative forcing. Using the data collected during the CARB research flights over the Los Angeles area we were able to extrapolate the annual emission of HFC-152a, one of the fastest increasing CFC replacement compounds measured.

Finally, we were able to determine the background and enhanced levels of selected oxygenated compound in the San Joaquin Valley.