
Impact Category. Photochemical oxidation Potential

Brief summary. Photochemical oxidation is secondary air pollution, also known as summer smog. It is formed in the troposphere caused mainly by the reaction of sunlight with emissions from fossil fuel combustion creating other chemicals (eg ozone)[1].

Units. kg ethylene equivalents

Detailed summary. Photochemical oxidant formation (or photochemical smog) refers to a phenomenon that occurs under certain atmospheric conditions when pollutant-forming emissions are present. It is particularly commonplace in relatively stagnant air when there is sunlight and low humidity, and in the presence of nitrogen oxides and volatile organic compounds (VOCs, excluding methane) [2]. Examples of VOCs are ethane, ethylene, benzene, acetone, and formaldehyde.

Photochemical oxidation causes breathing problems, eye irritation, damage to some materials (eg: plastic, rubber) and crops [2, 3].

Overall, New Zealand cities have relatively low ozone concentrations, in some cases very close to natural background concentrations. Photochemical smog episodes that do occur appear either to be generated locally or else the precursors are transported via the prevailing southwest wind [3]. However the focus of this research was Auckland, where occasional high ozone levels have been recorded in certain areas.

References.

1. Baumann, H. and A.-M. Tillman, The Hitchhikers guide to LCA. An orientation in life cycle assessment methodology and application. 1st ed. 2004: Studentlitteratur AB.
 2. Manahan, S.E., Environmental Chemistry. CRC Press. 1994.
 3. Adeeb, F. and D. Shooter. 2002. "Ozone Highs and Lows In Auckland." Water & Atmosphere 10(1): 9-11
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