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Atmospheric Photochemistry of 1,2-, 1,4- and 1,6- Dicarbonyls

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Dicarbonyls are one important class of products generated from the hydroxyl radical (OH) initiated atmospheric oxidation of monocyclic aromatic hydrocarbons (AHCs). They play key roles in the photochemistry of the troposphere, not only as sources of free radicals and organic aerosols, but also as precursors to carboxylic acids (R.CO.OH) and oxidants, including ozone (O₃), peroxyacyl nitrates (R.CO.OONO₂) and peroxydicarboxylic acids (R.CO.OOH). Special interests have been shown on 1,2-, 1,4- and 1,6-dicarbonyls, such as glyoxal (CHOCHO), 4-oxo-2-pentenal (CHOCH=CHCOCH₃) and butenedial (CHOCH=CHCHO), and 2,4-hexadienedial (CHOCH=CHCH=CHCHO), respectively. These species are very reactive and known to be either toxic or potentially toxic with both carcinogenic and mutagenic effects. Experimental data on the photolysis of 4-oxo-2-pentenal were reported, along with the comparison with the atmospheric photochemistry of 1,2- and 1,6- dicarbonyls.