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HCO quantum yields in the uv/vis photolysis of Glyoxal, HC(O)C(O)H, between 290 - 420 nm

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Glyoxal, HC(O)C(O)H, is an atmospherically abundant oxygenated volatile organic compound that is formed in the oxidation of a number of natural and anthropogenic compounds. The UV/vis photolysis of glyoxal has a direct influence on the atmospheric HOx production rate via the formation of HCO as a primary photolysis product. Glyoxal, therefore, plays an important role in regional air quality and ozone production. In this study, we report HCO quantum yields at 296 K following the photolysis of glyoxal in the wavelength range 290 – 420 nm at pressures between 50 – 550 Torr (N_2). Quantum yields were measured using pulsed laser photolysis of glyoxal combined with cavity ring-down spectroscopy detection of the HCO radical. HCO quantum yields were obtained using chemical reference systems for the photolytic production of HCO. The HCO quantum yield and its pressure dependence obtained in this work differ from the currently recommended values for use in atmospheric model calculations. The implications of these differences and revised estimates for glyoxal's atmospheric lifetime will be discussed.