Quantum yields of singlet molecular oxygen, O2(1?g), produced by antimalaric drugs in organic solvents

Valencia U, Cristina

Lemp, Else

Zanocco, Antonio L.

Detection of singlet molecular oxygen, O2(1? g), by phosphorescence emission, ? = 1270 nm, following laser excitation was employed to measure the quantum yield of O2(1?g) generation by the antimalaric drugs quinine, quinacrine, chloroquine and primaquine in several organic solvents. The same method was employed to measure total rate constants, kT, for quenching (physical and chemical) of O2(1? g) by the antimalaric drugs. All drugs studied sensitize singlet oxygen formation in organic media. Quinine was the most efficient sensitizer in the four solvents employed. Three of the drugs under study, quinine, quinacrine and chloroquine, produced efficiently singlet molecular oxygen in ethanol. Also, the antimalaric drugs are relatively efficient quenchers of singlet oxygen. Values of kT range from (0.63 ± 0.02) × 107 M-1 s-1 for primaquine in hexane to (17.1 ± 0.30) × 107 M-1 s-1 for primaquine in acetonitrile. Data obtained show that undesirable adverse cutaneous and ocular side effects as