Subject Index

Actinometer

convenient chemical, the use of flash photolysis of tetraphenylcyclobutane in solution as a, 49 potassium ferrioxalate, use of below 254 nm, 69

Adenosine

and its phosphates, luminescence characteristics of, 313

Alkyl substituents

influence of on Norrish type II reactions for poly-4'-alkylacrylophenones, 301

Amines

aliphatic, near diffusion controlled photokinetics in aromatic esteraliphatic amine systems, 429

Aminoanthraquinones

and hydroxyanthraquinones in manmade polymers, structural influences on the light stability of, 101

Anthracene

effect of solvent on exciplex emission from pyrene-tributylamine and anthracene-tributylamine systems, 261

Arvl halides

a model for the photodissociation of, 385

Aryl vinyl sulphides

competition between cyclization and polymerization in the photochemistry of, 215

Aza-aromatics

excited state reactivity of: production and quenching of triplet naphthylpyridylethylene by halide anions, 79

Benzanthracene

a study of the physical binding of to DNA bases by optically detected magnetic resonance, 249

Benzoperylene

photocyclodehydrogenation of pentahelicene to, 197

Benzoylpyridine-4-nitrophenylhydrazones

direct and sensitized syn-anti photoisomerization of, 39 Bicyclo [2.2.1] heptene-2,3-dione temperature dependence of competing photoisomerization and fluores-

cence decay of, 287

Binding

physical, of benzanthracene to DNA bases, a study of by optically detected magnetic resonance, 249

2,2'-Bipyridyl

fluorescence of, 413

Biradicals

photogenerated, and free radicals, interaction between: di-tert-butylnitroxide, 241

Branching ratio

of O(1D)/N₂O at 290 K, 173

Bromine chloride

formation of excited BrCl (B³ II(0⁺)) in the reaction of Br₂ with OClO, 87

n.Butryaldehyde

quenching of the photodecomposition of in the vapour phase and in isooctane, 333

Carbon suboxide

vacuum UV luminescence in the flash photolysis of, 121

Carcinogens

triplet ← singlet and singlet → triplet transitions of some, 219

Chemiluminescence

emitted during the decomposition of the endoperoxide of 1,4-dimethoxy-9,10-diphenylanthracene formed by photooxidation, 129

from excited BrCl (B³ II(0⁺)) formed in the reaction of Br₂ with OClO, 87

indirect, of different tetramethyl-1,2dioxetane-acceptor pairs, quenching of by 2,4-hexadiene, 145

nitric oxide β band, enhancement effects of atomic oxygen on, 63 vacuum UV, in the flash photolysis of

carbon suboxide, 121

Chloride dioxide

formation of excited BrCl $(B^3\Pi(0^+))$ in the reaction of Br₂ with, 87

Chlorine nitrate

UV absorption spectrum of at stratospheric temperatures, 139

Chlorocopper(II) complexes

in acetonitrile, photoredox behaviour of: mechanisms and quantum yields of. 321

Cobalt

direct measurement of the Co^{III}_C bond homolysis rate after visible excitation of a methylcobaloxime, 73

Copper(I) chloride

photochromic properties of the system CuCl(s)-H₂O(1) in relation to the composition of the aqueous solution 403

Copper(II) complexes

photoredox behaviour of chlorocopper-(II) complexes in acetonitrile; mechanisms and quantum yields, 321

Cyclization

and polymerization, competition between in the photochemistry of aryl vinyl sulphides, 215

1,1-Dichloro-2,2-difluoromethane kinetics of the photochemical reaction of with CF₃OCl, 1

3,9-Dicyanophenanthrene

effect of multiplicity on regiochemistry of 2 + 2 photocycloaddition of to trans-β-methylstyrene, 165

1,4-Dimethoxy-9,10-diphenylanthracene photooxidation of and the chemiluminescent decomposition of its endoperoxide, 129

Dimethylaniline

emission from exciplexes formed with hydrocarbons in hydroxylic solvents, 9

Dipole moments

of exciplexes between excited aromatic esters and triethylamine, 361

Di-tert-butylnitroxide

interaction between photogenerated biradicals and free radicals, 241

DNA bases

a study of the physical binding of benzanthracene to by optically detected magnetic resonance, 249

Emission

from hydrocarbon-dimethylaniline exciplexes in hydroxylic solvents, 9 Endoperoxides

photooxidation of 1,4-dimethoxy-9, 10-diphenylanthracene and the chemiluminescent decomposition of its endoperoxide, 129

Energy

wastage of in organic photochemistry: self-quenching in thiones, 135

Energy transfer

in different tetramethyl-1,2-dioxetaneacceptor pairs, 145

electronic: a coherent formalism for pulsed and steady state irradiation, 273

of oxalyl fluoride (³A_u) molecules, 375 Enhancement effects

of atomic oxygen on nitric oxide β band chemiluminescence, 53

Esters

aromatic, excited states of, 109
near diffusion controlled photokinetics in aromatic ester-aliphatic
amine systems, 429
quenching of the excited states of
by triethylamine, 361

Exciplex emission

from pyrene-tributylamine and anthracene-tributylamine systems, effect of solvent on, 261

Exciplexes

between excited aromatic esters and triethylamine, 361

hydrocarbon-dimethylaniline, emission from in hydroxylic solvents, 9

Flash photolysis

of carbon suboxide, vacuum UV luminescence in, 121

of cattle rhodopsin in solution: determination of kinetic activation parameters, 419

of pentahelicene to give benzoperylene, 197

of tetraphenylcyclobutane in solution

— a convenient chemical actinometer, 49

Fluorescence

of adenosine and its phosphates, 313 of 2,2'-bipyridyl, 413

of excited states of aromatic esters, 109

and photodegradation of aqueous tryptophan, 297

Fluorescence decay

and photoisomerization, competing, the temperature dependence of for bicyclo[2.2.1]heptene-2,3-dione, 287

Formaldehyde

photooxidation of at 3130 Å in the absence and presence of NO, 183

Halomethanes

quenching of UF₆ (A state) by, 369

Homolysis

of the Co^{III}-C bond, direct measurement of the rate of after visible excitation of a methylcobaloxime, 73

Hydrocarbons

emission from exciplexes formed with dimethylaniline in hydroxylic solvents, 9

Hydrogen abstraction

by ketones, a perturbational treatment of the process of, 347

Hydroxyanthraquinones

and aminoanthraquinones in man-made polymers, structural influences on the light stability of, 101

Iron

photochemical mechanisms of the Fe-thionine system, 27

Irradiation

pulsed and steady state, a coherent formalism for, 273

Ketones

perturbational treatment of the process of hydrogen abstraction by, 347

Kinetic activation parameters

determination of by flash photolysis of cattle rhodopsin in solution, 419

Kinetics

of the photochemical reaction between CF₃OCl and CF₂CCl₂, 1

of the photolysis of UF₆ and some reaction variables affecting the apparent quantum yield, 393

of quenching of oxalyl fluoride (${}^{3}A_{u}$) molecules, 375

Lifetimes

of excited states of some carcinogenic compounds, 219

of fluorescence of aqueous tryptophan, 297

of fluorescence of excited states of aromatic esters, 109

of phosphorescence of excited states of aromatic esters, 109

Light stability

of 2-substituted aminoanthraquinones and hydroxyanthraquinones in manmade polymers, structural influences on, 101

Luminescence

characteristics of for adenosine and its phosphates, 313

Methylcobaloxime

direct measurement of the Co^{III}-Co bond homolysis rate after visible excitation of a, 73

trans-β-Methylstyrene

effect of multiplicity on regiochemistry of 2 + 2 photocycloaddition of 3,9dicyanophenanthrene to, 165

γ-Methylvalerophenone

interaction of biradicals from with ditert-butylnitroxide, 241

Multiplicity

effect of on regiochemistry of 2 + 2 photocycloaddition of 3,9-dicyanophenanthrene to trans-β-methylstyrene, 165

Naphthylpyridylethylene

triplet, production of and quenching of induced by halide anions, 79

Nitric oxide

absolute rate constants for the reaction of O(³P) with NO in Ar from 237 to 397 K, 293

enhancement effects of atomic oxygen on the β band chemiluminescence of, 63

photooxidation of CH₂O at 3130 Å in the absence and presence of, 183 production of in the stratosphere from the reaction of O(¹D) with N₂O, 173

Nitrous oxide

O(¹D)/N₂O branching ratio at 290 K, 173

Norrish type II reactions

for polyacrylophenones, the influence of alkyl substituents on, 301

Optically detected magnetic resonance a study of the physical binding of benzanthracene to DNA bases by, 249

Oxalyl fluoride

quenching of molecules of in the ${}^3A_{\rm u}$ state, 375

Oxygen

atomic, absolute rate constants for the reaction of O(³P) with NO in Ar from 237 to 397 K, 293 enhancement effects of on nitric oxide β band chemiluminescence, O(¹D)/N₂O branching ratio at 290 K. 173

Pentahelicene

photophysics and photochemistry of,

Perrin model

expression of within a coherent formalism for pulsed and steady state irradiation, 273

Perturbation theory

applied to the process of hydrogen abstraction by ketones, 347

Phenylcyclopropane

photochemistry of, 227

Phosphorescence

of adenosine and its phosphates, 313 of excited states of aromatic esters,

Photochemical mechanisms

for photogalvanic cells general treatment, 15

the Fe-thionine system, 27

Photochemical reaction

between CF₃OCl and CF₂CCl₂, kinetics of, 1

Photochemistry

of aryl vinyl sulphides: competition between cyclization and polymerization, 215

gas phase, of phenylcyclopropane, 227 organic, energy wastage in: self-

quenching in thiones, 135

Photochromic properties

of the system CuCl(s)-H2O(l) in relation to the composition of the aqueous solution, 403

Photocycloaddition

2 + 2, of 3,9-dicyanophenanthrene to trans- β -methylstyrene, the effect of multiplicity on regiochemistry of, 165

Photocyclodehydrogenation

of penthelicene to benzoperylene, 197

Photodegradation

and fluorescence of aqueous tryptophan, 297

Photodissociation

of pentahelicene to benzoperylene, 197 Photogalvanic cells

photochemical mechanisms for general treatment, 15 the Fe-thionine system, 27

Photoisomerization

direct and sensitized syn-anti, of benzoylpyridine-4-nitrophenylhydrazones, 39

and fluorescence decay, competing, the temperature dependence of for bicyclo[2.2,1]heptene-2,3-dione, 287

Photokinetics

near diffusion controlled, in aromatic ester-aliphatic amine systems, 429

Photolysis

of n-butyraldehyde in the vapour phase and in isooctane, 333

of UF6 and some reaction variables affecting the apparent quantum yield, 393

Photooxidation

of CH₂O at 3130 Å in the absence and presence of NO, 183

of 1,4-dimethoxy-9, 10-diphenylanthracene and the chemiluminescent decomposition of its endoperoxide, 129

Photophysics

and photochemistry of pentahelicene,

Photoredox behaviour

of chlorocopper(II) complexes in acetonitrile: mechanisms and quantum yields, 321

Poly-4'-alkylacrylophenones

influence of alkyl substituents on Norrish type II reactions for, 301

Polymerization

and cyclization, competition between in the photochemistry of aryl vinyl sulphides, 215

Polymers

man-made, structural influences on the light stability of aminoanthraquinones and hydroxyanthraquinones in, 101

Potassium ferrioxalate

use of the potassium ferrioxalate actinometer below 254 nm, 69

Pyrene

effect of solvent on exciplex emission from pyrene-tributylamine and anthracene-tributylamine systems, 261

Quantum yields

of fluorescence from excited states of aromatic esters, 109

for photolysis of UF₆, and some reaction variables affecting, 393

Quenching

of excited aromatic esters by triethylamine, 361

by halide anions of triplet naphthylpyridylethylene, 79

of the indirect chemiluminescence of different tetramethyl-1,2-dioxetaneacceptor pairs by 2,4-hexadiene, 145

of luminescence, derivation of a set of equation describing, 273

of oxalyl fluoride (³A_u) molecules, 375

of the photochemical decomposition of n-butyraldehyde in the vapour phase and in isooctane, 333

of UF₆ (A state) by halomethanes, 369

Radiationless transitions

in the photochemistry of phenylcyclopropane, 227

Rate constants

absolute, for the reaction of O(³P) with NO in Ar from 237 to 397 K, 293

Rate parameters

of radiationless transitions in some carcinogenic compounds, 219

Reactivity

excited state, of aza-aromatics: production and quenching of triplet naphthylpyridylethylene induced by halide anions, 79

Regiochemistry

of 2 + 2 photocycloaddition of 3,9dicyanophenanthrene to trans-βmethylstyrene, the effect of multiplicity on, 165

Rhodopsin

cattle, flash photolysis of in solution: determination of kinetic activation parameters, 419

Ring closure

of pentahelicene, 197

Self-quenching

in thiones: energy wastage in organic photochemistry, 135

Solar energy

photochemical mechanisms of the conversion of in photogalvanic cells general treatment 15, the Fe-thionine system, 27

Solvent effects

on the fluorescence from excited states of aromatic esters, 109

Stern-Volmer relation

expression of within a coherent mathematical formalism for pulsed and steady state irradiation, 273

Stratosphere

investigation of the stratospheric reaction of O(¹D) with N₂O, 173 UV absorption spectrum of chlorine

nitrate at temperatures of the, 139

Structural influences

on the light stability of 2-substituted aminoanthraquinones and hydroxyanthraquinones in man-made polymers. 101

Sulphides

aryl vinyl, competition between cyclization and polymerization in the photochemistry of, 215

Tetramethyl-1,2-dioxetane

quenching of the indirect chemiluminescence of different pairs formed between and acceptors by 2,4-hexadiene, 145

Tetraphenylcyclobutane

flash photolysis of in solution — a convenient chemical actinometer, 49

Thiones

self-quenching in: energy wastage in organic photochemistry, 135

Thionine

photochemical mechanisms of the Fe-thionine system, 27

Tributylamine

effect of solvent on exciplex emission from pyrene-tributylamine and anthracene-tributylamine systems, 261

Triethylamine

quenching of excited states of aromatic esters by, 361

Trifluoromethylhypochlorite

kinetics of the photochemical reaction of with CF₂CCl₂, 1

Triplet states

 $n\pi^*$ and $\pi\pi^*$, of ketones, perturbational treatment of the process of hydrogen abstraction by, 347

Tryptophan

aqueous, photodegradation and fluorescence of, 297 Ultraviolet spectrum
of chlorine nitrate at stratospheric
temperatures, 139
Uranium hexafluoride
photolysis of and some reaction

variables affecting the apparent quantum yield, 393 quenching of UF₆ (A state) by halomethanes, 369