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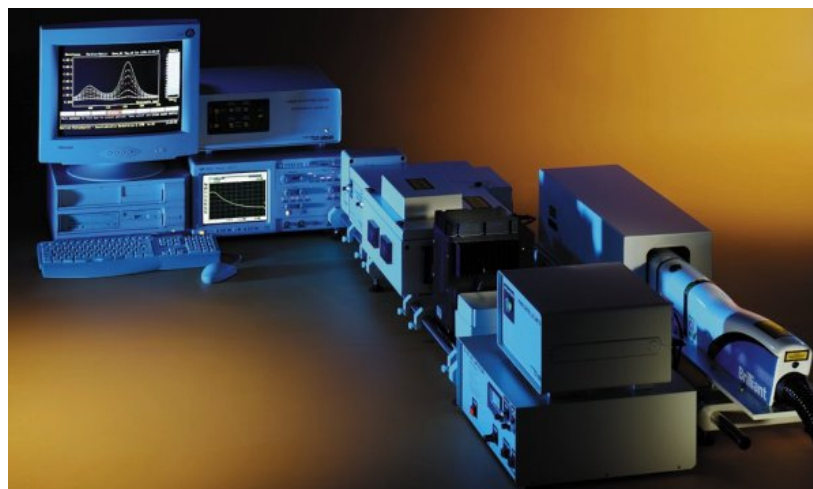
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Spectroscopy Article

"Structure and Thermodynamics of a Monoclonal Antibody Biotherapeutic in Different Formulations"



Chemical kinetics and reaction mechanisms



The study of the reaction kinetics can yield tremendous insight into the mechanisms of a chemical reaction. APL stopped-flow and laser-flash photolysis instruments are excellent tools for measurements of reaction kinetics to provide insight into chemical reaction mechanisms.

Chemical kinetics involves the study of rates of chemical processes. Measurements of the rates of reactions under different experimental conditions (for instance pH, solvent, concentration and temperature) allow the construction of mathematical models that satisfy and describe the characteristics of a chemical reaction. This model provides insights into the reaction mechanism and transition states involved in the chemical process.

Stopped-flow spectrophotometers like the [SX20](#) allow the following of reaction kinetics, initiated by the mixing of two (or more) reactants, from the millisecond time range onwards. This allows a very diverse range of mechanism of many different types of fast chemical process to be studied. For a more in depth explanation of the stopped-flow method please read the [tutorial](#).

Laser flash photolysis using the [LKS.60](#) allows the reactions occurring in the nanosecond time range to be studied. Reactions are initiated by a very brief pulse of laser light. Then data is collected using a number of spectrometric techniques. This allows ultrafast reactions processes to be studied, provided that the process can be initiated with a flash of laser light. For a more in depth explanation of the laser flash photolysis method please read the [tutorial](#).

Relevant Stopped-flow References

Below are listed 2 selected recent references of studies of chemical reaction mechanisms using our SX range of instruments are listed below. A complete searchable database with all references can be accessed by [logging into](#) the APL members area.

Authors	Title	Year	Keywords	Journal/Proceedings
Brendan Garrett and Richard A. Henderson	Direct studies on 5-coordinate intermediates formed during substitution at tetrahedral Fe sites: role of bound nucleophile in labilisation of leaving group [Abstract] [URL]	2007	Fe-Cl bond dissociation, Inorganic kinetics, stopped-flow	J CHEM SOC DALTON TRANS, 2007, Iss 31, pp 3435-3439
Ria Yngarda, Seelawut Damrongsirib, Khemarath Osathaphanb and Virender K. Sharmaa, Corresponding Author Contact Information, E-mail The Corresponding Author	Ferrate(VI) oxidation of zinc-cyanide complex [Abstract] [URL]	2007	Ferrate(VI), Cyanide, Zinc-cyanide complex, Kinetics, Oxidation, Rinse water	CHEMOSPHERE, 2007, Vol 69, Iss 5, pp 729-735

Relevant Laser Flash Photolysis References

Below are listed 5 selected recent reference of studies of chemical reaction mechanisms using our LKS range of instruments are listed below. A complete searchable database with all references can be accessed by [logging into](#) the APL members area.

Authors	Title	Year	Keywords	Journal/Proceedings
Ayman A. Abdel-Shafi, Jose L. Bourdelande and Sameh S. Ali	Photosensitized generation of singlet oxygen from rhenium(I) and iridium(III) complexes [Abstract] [URL]	2007	singlet oxygen, rhenium(I), Iridium(III), laser flash photolysis	J CHEM SOC DALTON TRANS, 2007, Iss 24, pp 2510-2516
C. Busset, P. Mazellier, M. Sarakha and J. De Laat	Photochemical generation of carbonate radicals and their reactivity with phenol [Abstract] [URL]	2007	phenol, carbonate radical, laser flash excitation,	J PHOTOCHEM PHOTOBIOL A-CHEM, 2004, Vol 185, Iss 2-3, pp 127-132
Pascal Wong-Wah-Chung, Salah Rafqah, Guillaume Voyard and Mohamed Sarakha	Photochemical behaviour of triclosan in aqueous solutions: Kinetic and analytical studies [Abstract] [URL]	2007	Triclosan; Irgasan DP300; Photolysis; Dioxin; Photocyclization	J PHOTOCHEM PHOTOBIOL A-CHEM, 2007, Vol 191, Iss 2-3, pp 201-208
Malgorzata Insinska-Rak, Ewa Sikorska, Jose L. Bourdelande, Igor V. Khmelinskii, Wieslaw Prukala, Krzysztof Dobek, Jerzy Karolczak, f, Isabel F. Machado, Luis F.V. Ferreira, Ewa Dulewicz, Anna Komasa, David R. Worrall, Maciej Kubicki and Marek Sikors	New photochemically stable riboflavin analogue—3-Methyl-riboflavin tetraacetate [Abstract] [URL]	2007	Flavin analogue; 3-Methyl-riboflavin tetraacetate; Riboflavin; TD-DFT method; Triplet states; Photosensitizer; Singlet oxygen; Photodegradation; Crystallographic characteristics; Time-resolved fluorescence spectra	J PHOTOCHEM PHOTOBIOL A-CHEM, 2007, Vol 186, Iss 1, pp 14-23
Anthony Harriman, Laura J. Mallon, Gilles Ulrich, Raymond Ziessel	Rapid Intersystem Crossing in Closely-Spaced but Orthogonal Molecular Dyads [Abstract] [URL]	2007	charge transfer , chemical sensors, dyes/pigments, fluorescence, triplet state	CHEMPHYSICHEM, 2007, Vol 8, Iss 8, pp 1207-1214

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