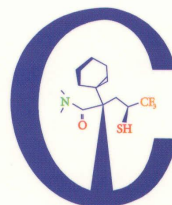




*Fourth International Youth
Conference on Organic Synthesis*

*June 27-30, 2005
St. Petersburg, Russia*



*MODERN TRENDS IN ORGANIC SYNTHESIS
AND PROBLEMS OF CHEMICAL EDUCATION*



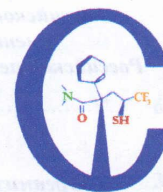
ABSTRACTS

*St. Petersburg
2005*



**Четвертая международная
конференция молодых ученых
по органической химии**

**27-30 июня, 2005 г.
Санкт-Петербург, Россия**



**СОВРЕМЕННЫЕ ТЕНДЕНЦИИ В
ОРГАНИЧЕСКОМ СИНТЕЗЕ И ПРОБЛЕМЫ
ХИМИЧЕСКОГО ОБРАЗОВАНИЯ**



МАТЕРИАЛЫ КОНФЕРЕНЦИИ

**Санкт-Петербург
2005**

**Санкт-Петербургский
государственный университет
Лейпцигский университет
Российское химическое общество
имени Д.И. Менделеева
Российский педагогический университет**

**St. Petersburg State University
University of Leipzig, Germany
D.I. Mendeleev's Chemical Society of Russia
Russian Pedagogical University**

Организационный комитет

Organizing Committee

Проф. Л. Л. Родина – председатель, С.-Петербургский университет
Проф. А. А. Потехин – сопредседатель, С.-Петербургский университет
Проф. Р. Р. Костиков – С.-Петербургский университет
Акад. А.И. Русанов – С.-Петербургский университет
Проф. И.В.Мурин – С.-Петербургский университет
Проф. А.Ю. Билибин – С.-Петербургский университет
Проф. Ю. Е. Ермоленко – НИИ Химии СПбГУ
Проф. В. Schulze – Лейпцигский университет, Германия
Проф. H.Heimgartner – Цюрих, Швейцария
Проф. И.Г. Зенкевич – С.-Петербургский университет
Проф. М. А. Кузнецов – НИИ Химии СПбГУ
Проф. А. Ф. Хлебников – С.-Петербургский университет
Доц. А. П. Молчанов – С.-Петербургский университет
Вед.н.с. И. Н. Домнин – С.-Петербургский университет
Вед.н.с. В. А. Николаев – НИИ Химии СПбГУ
Доц. И. А. Балова – С.-Петербургский университет
Доц. В.С. Караван – С.-Петербургский университет
Проф. А.Г. Шавва – С.-Петербургский университет
Проф. В. М. Берестовицкая – Российский педагогический университет
д.х.н., проф. Г.А.Шагисултанова – Российский Педагогический университет
С.В. Галиуллина – секретарь, С.-Петербургский университет
В.М. Захарова – С.-Петербургский университет

Prof. L.L.Rodina – chairwoman, St.-Petersburg State University
Prof. A.A.Potekhin – deputy chairman, St.-Petersburg State University
Prof. R.R.Kostikov – St.-Petersburg State University
Acad. A.I. Rusanov – St.-Petersburg State University
Prof. I.V.Murin – St.-Petersburg State University
Prof. A.Yu.Bilibin – St.-Petersburg State University
Prof. Yu.E.Ermolenko – St.-Petersburg State University
Prof. B. Schulze – University of Leipzig, Germany
Prof. H.Heimgartner – Zurich, Switzerland Швейцария
Prof. I.G.Zenkevich – St.-Petersburg State University
Prof. M.A.Kuznetsov – St.-Petersburg State University
Prof. A.Ph. Khlebnikov – St.-Petersburg State University
Acc.prof. A.P.Molchanov – St.-Petersburg State University
Senior researcher I.N. Domnin – St.-Petersburg State University
Senior researcher V.A.Nikolaev – St.-Petersburg State University
Acc.prof. I.A.Balova – St.-Petersburg State University
Acc.prof. V.S. Karavan – St.-Petersburg State University
Prof. A.G.Shavva – St.-Petersburg State University
Prof. V.M. Berestovitskaya – Russian Pedagogical University
Prof.G.A.Shagisultanova – Russian Pedagogical University
S.V. Galiullina – secretary, St.-Petersburg State University
V.M. Zakharova – St.-Petersburg State University

**Конференция проводится при финансовой поддержке:
Российского фонда фундаментальных исследований (грант № 05-03-42030)
ОАО «Морская арктическая геологоразведочная экспедиция» (ОАО МАГЭ)
ЗАО «Невский капитал»
АО «Экрос»
ООО «Астрохим»
Федеральный научно-производственный центр Санкт-Петербургский завод «ГОСМЕТР»**

ISBN S-93852-004-5

© НИИ Химии СПбГУ, 2005

Подписано к печати 27.05.2005. Сдано в производство 30.05.2005.
Формат бумаги 84X120 1/16. Бумага офсетная. Печать ризографическая.
Объем 25,25 п.л. Тираж 300 экз. Заказ № 53487.

Издательство ЗАО «Строка»
Отпечатано в типографии ООО «Уни-Принт»,
191119, г. Санкт-Петербург, ул. Достоевского, 44

CONTENTS

PREFACE	6
I PLENARY LECTURES	31
<u>M. Mąkosza</u> New synthesis of tetrahydrofurans, pyrrolidines and cyclopentanes via reactions of γ -halocarbanions (I-1).....	33
<u>Changchun Fu, A. Fedorov, A. Linden, H. Heimgartner</u> Regio- and stereoselective formation of 1,3-oxathiolanes from thiocarbonyl compounds and oxiranes (I-2).....	34
<u>A. M. Trzeciak, J. J. Ziótkowski</u> Palladium and rhodium organometallic complexes in ionic liquids medium as catalysts of c-c bond formation reactions (I-3).....	36
<u>Yu. B. Koptelov, D. I. Sipkin, A. P. Molchanov, R. R. Kostikov</u> Chemical transformations of the labile azomethine imines formed by the ring opening of a diaziridine fragment included in the polycyclic structures (rus) (I-4).....	37
<u>Prof. Dr. Giannis, A.</u> Natural products and their analogues as tools for chemical biology (I-5).....	38
<u>H. Ohruai, S. Kohgo, K. Kitano, N. Ashida, H. Hayakawa, E. Kodama, M. Matsuoka, H. Mitsuya</u> Development of 4'-c-ethynyl-2'-deoxy-2-fluoroadenosine, a nucleoside highly potent against all hiv-1 with no acute mouse toxicity; highlight on the role of 3'-oh for biological activity (I-6).....	39
<u>Efremova I.E., Berestovitskaja V.M.</u> Polynitro- and halogenitro-derivatives of thienothiophen-1,1-dioxide series (Rus) (I-7).....	40
<u>Maslivets A.N., Bozdyreva K.S., Bannikova Yu.N., Racheva N.L., Novikov A.A., Babenysheva A.V., Smirnova S.A., Csherbina I.A.</u> Recyclization and heterocyclization of dioxoheterocycles – a method for the creation of heterocyclic systems (Rus) (I-8).....	41
<u>Hennig, L.</u> Fluorine-hydrogen short contacts in fluorinated acylthioureas (I-9).....	42
<u>A. Poloukhine, G. Karpov, V. Popik</u> Towards photoswitchable enediyne antitumor antibiotics: design, synthesis, photochemistry and bergman cyclization of prototype enediynes (I-10).....	43
<u>Domnin I. N., Vyazmin S. Yu.</u> Conjugated diynes: synthesis and properties (I-11).....	44
<u>Croft, A. K.</u> Using models to explore radical systems (I-12).....	45
<u>B. Schulze, A. Eilfeld, J. Fahrig</u> Oxyfunctionalization of n-aryl-, biaryl- and heteroaryliothiazolium salts to 3-oxosultams (I-13).....	46

CONTENTS

II ORAL COMMUNICATION	47
<u>Budynina E.M., Ivanova O.A., Averina E.B., Kuznetsova T.S., Zefirov N.S.</u> The first synthesis and reactivity of 1,1-dinitrocyclopropane (II-14).....	49
<u>V. V. Shevchenko, V. A. Nikolaev</u> Thermal and photochemical reactions of 3,3-diacyl diazirines: new mechanism of the Wolff rearrangement (II-15).....	51
<u>D.N. Kozhevnikov, V.N. Kozhevnikov</u> Methodology for the synthesis of substituted pyridines. (II-16).....	52
<u>A. Zanobini and A. De Meijere</u> Microwave-assisted one-pot approach to 2-spirocyclopropanated monocyclic β -lactams (II-17).....	53
<u>Antipin R.L., Klak V.N., Beloglazkina N.V., Zyk N.V.</u> β -Halogen-selenation of alkenes and alkynes activated via oxohalides of phosphorus (V) (Rus) (II-18).....	54
<u>Skornjakov U.V., Tereshenko D.S., Proskurina M.V., Zefirov H.C.</u> Nucleophilic ring opening of cyclopropanones by cyanide-anion (II-19).....	55
<u>J. Schatz</u> The Suzuki Cross-Coupling Reaction of Aryl Chlorides in Aqueous Media Catalyzed by in-situ Generated <i>N</i> -Heterocyclic carbene ligands based on calix[4]arenes (II-20).....	57
<u>Cigeev A.S., Peregudov A.S., Petrovskij P.V., Beletckaja I.P.</u> New examples of reactions catalyzed by copper complexes with bidentant <i>N,N</i> -ligands (Rus) (II-21).....	58
<u>V.M. Zakharova, V.A. Nikolaev</u> Elaboration of the powerful approach to fluorinated pyridazines using fluorine-containing diazodiketones and vinyl diazoketones (II-22).....	60
<u>Gazizov A.S., Volodina Yu.M., Burilov A.R., Pudovik M.A., Kononov A.I., Habiher V.D.</u> Investigation of Reactions of resorcinol and 2-methylresorcinol using aminoaldehydes and their acetals (Rus) (II-23).....	61
<u>Kasymova E.M., Burilov A.R., Bukharov S.V., Nugumanova G.N., Mukmeneva N.A., Enikeev K.M., Pudovik M.A., Habiher V.D., Baier I., Kononov A.I.</u> Reactions of calix[4]resorcinols with 3,5-ditert-butyl-4-hydroxybenzylacetate and properties of the products formed (Rus) (II-24).....	63
<u>Gulenova M.V., Stepovik L.P.</u> Transformations of organic and elementorganic hydroperoxides with titanium alkoxides (Rus) (II-25).....	64
<u>Butakov V.V., Khlectkin V.K., Reznikov V.A.</u> Unsaturated Mannich bases in the synthesis of heterocyclic compounds (Rus) (II-26).....	66

CONTENTS

<u>Eremkin A.V., Mol'kov S.N., Ershov O.V.</u> Interaction of 2-halogeno-6-hydroxi-5,5-dimethyl-5,6-dihydro-1h-pyridin-3,4,5-thri with aliphatic alcohols (Rus) (II-27).....	67
<u>M.A.Samartsey, B.A.Ershov</u> Imide cycle opening accompanying nucleophilic 1,2-addition of amines to n-arylmaleimides (II-28).....	69
<u>Rubtcov A.E., Shardt I.G., Zalecov V.V</u> Synthesis and chemical transformations of 5-aryl-3-arylimino-3H-furan-2-ones (Rus) (II-29).....	71
<u>Yu.V. Dadali, V.A. Dadali</u> The interaction of ubiquinone (CoQ) with flavonoids in aprotic solvents (II-30).....	73
<u>Amalchieva O.A., Grinev V.S., Egorova A.Yu.</u> Reaction of 5-3(H)-furan-2-ones with <i>o</i> -aminophenol (Rus) (II-31).....	75
<u>Semenov V.E., Reznik V.S., Nikolaev A.E.</u> Reaction of 1,3-bis(bromoalkyl)uracils with some amines (Rus) (II-32).....	76
<u>Jarovaja O.I., Salomatina O.V., Korchagina D.V., Barkhash V.A.</u> Epoxyderivatives of terpenes as a source of the polyfunctional oxygen-containing compounds (Rus) (II-33).....	77
<u>K.Yu. Lebedev, E.V. Shkلياeva, A.N. Nedugov, I.V. Osorgina, G.G. Abashev</u> Synthesis of tetrathiafulvalenes with carbazol and fluorene moieties (II-34).....	78
<u>Vigorov A.Yu., Nizova I.A., Matveeva T.V., Kodess M.I., Sdreddinova L.Sh., Grishakov A.N., Krasnov V.P.</u> Study of the interaction of dimethyl <i>N</i> -phthaloyl-4-bromoglutamate with piperidine (II-35).....	80
<u>Nikolaev Vs.V., Kostikov R.R., Nikolaev V.A., Schulze B.</u> New Rh(II)-catalyzed Reactions of Diazocarbonyl Compounds with Imides and Sulfonimides (II-36).....	82
<u>Mazhuga A.G., Beloglazkina E.K., Yudin I.V., Frolova N.A., Romashkina R.B., Zyk N.V.</u> Derivatives of pyridylsubstituted 2-thiohydantoines and their complexes with transition metals: synthesis and physico-chemical properties (Rus) (II-37).....	83
<u>Pavlova I.V., Sokolov Yu.A., Vasadze S.Z., Kuramshin A.I., Cherkasov R.A.</u> Coordination of unsaturated <i>O</i> - and <i>S</i> -containing compounds with metals of chromium-group. Intracoordinative hydrophosphorylation of ketones, enones, dienones and their sulphur-containing analogues. (Rus) (II-38).....	84
<u>Zaitseva J.V., Dubinskaya E.I., Voronkov M.G.</u> Diorganodichlorosilane reaction with oxygen-containing inorganic, organic and organosilicon compounds as route to the cyclic and linear siloxane structures (II-39).....	86
<u>Luchkina L.V., Askadskij A.A., Bychko K.A., Kazantceva V.V.</u> C Synthesis of hard polymeric materials on basis of polyurethanes (Rus) (II-40).....	88

CONTENTS

III POSTER SESSION	89
III A. ORGANIC SYNTHESIS (III-41 – III-171)	91
III B. SYNTHESIS OF NATURAL & BIOLOGICALLY ACTIVE COMPOUNDS AND POLIMERS (III-172 – III-215)	261
III C. METHODS OF INVESTIGATION IN ORGANIC CHEMICTRY (III-216 – III-264)	325
AUTHOR INDEX	393

**DYNAMICS OF FLUORESCENCE DYES,
DIPHENYLHEXATRIENE AND POLYTIOPHENS,
IN FREE AND CONFINED FORMS***

Peter Chandoga^{a,c}, Jozef Kuruc^b, Ignác Bugár^c, Dusan Velic^{a,c}, Dušan Chorvát^c

^aDepartment of Physical Chemistry,

^bDepartment of Nuclear Chemistry, Faculty of Natural Sciences, Comenius University,
Mlynska dolina CH-1, 842 15 Bratislava, Slovak Republic, e-mail: kuruc@fns.uniba.sk

^cInternational Laser Center, Ilkovicova 3, 812 19 Bratislava, Slovak Republic

A development of laser technology pushed the limits of time-resolved techniques dealing with dynamics of chemical interaction. Observation of a chemical reaction in real time [1] started a wide spreading use of time-resolved experiments in all branches of chemistry. Those experiments span from a solvation dynamics [2], to excited electron relaxation on solid metallic surfaces [3]. Our experiment focuses on dynamic of fluorescence as a function of interactions between solute and solvent. The main relaxation channel of this process is the interaction between charge distribution of solute and dipoles of solvent molecules. The result of this interaction is reorientation of solvent, a consequence of dielectric response as a measure of dipoles reorientation. The involved processes are internal relaxation, interaction with the environment and the fluorescence itself. The fastest process is the internal conversion and just this aspect of fluorescence dynamics is possible to measure with an experimental set-up providing picosecond time resolution.

The studied subjects of our experiments are organic dyes based on 1,6-diphenyl-1,3,5-hexatriene (DPH) and polytiophens. The interconversion rates between the two states determine the average lifetime [4]. For DPH in solvents, the lifetimes of fluorescence are solvent dependent. Relaxation of fluorescence measured at different wavelengths is shown in Fig. 1., for acetone. It describes different electronic energetic and vibrational states.

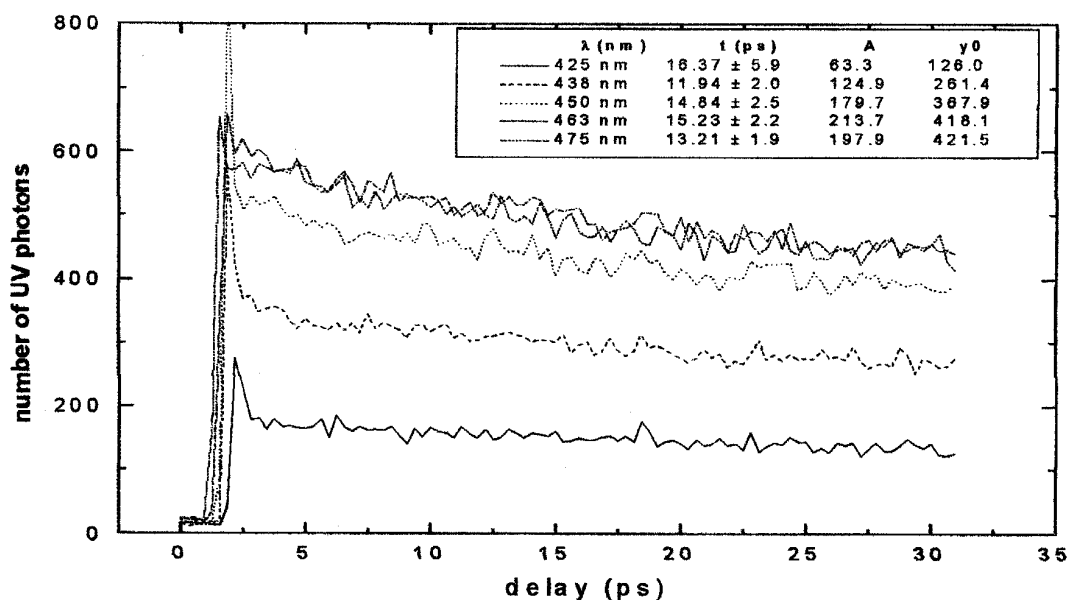


Figure 1

Fluorescence intensity in up-converted UV photons of DPH in acetone at different wavelengths

* VEGA grant 1/0216/03 is appreciated.

Fig. 1. shows spectra and mono-exponential fit parameters. The excitation and fluorescence spectra of DPH were measured in ethanol, methanol, acetone and *n*-hexane. The static fluorescence spectra were measured with Fluorog 3.11 system. The wavelength maxima of the DPH structure are 400, 423 and 451 nm, 402, 424 and 450 nm, 404, 426 and 452 nm, and 402, 425 and 450 nm in ethanol, methanol, acetone, and *n*-hexane, respectively. The intensity of fluorescence changes with the concentration as follows. The solutions of ethanol, methanol, acetone, and *n*-hexane were measured in the concentration range from 5×10^{-4} to 10^{-6} M and their intensities decreased from 716000 to 57000 photons s^{-1} , 341000 to 70500 photons s^{-1} , 380000 to 28500 photons s^{-1} , and 166000 to 17000 photons s^{-1} , respectively. Dynamics of DPH seems to be independent on the wavelength in accord with static spectra provided minimal Stokes shifts.

The fluorescence relaxation dynamics was investigated by using femtosecond time-resolved fluorescence. The applied technique is based on up-conversion of the fluorescence signal with the delayed probing signal. The fundamental pulse used both for the fluorescence excitation (doubled before) and the probing, are generated from the Ti-sapphire oscillator. The time resolution of this technique is approximately 100 fs.

The time-resolved fluorescence dynamics of polytiophen was also investigated. Fig. 2. shows spectra and double-exponential fit parameters of polytiophens in chlorophorm.

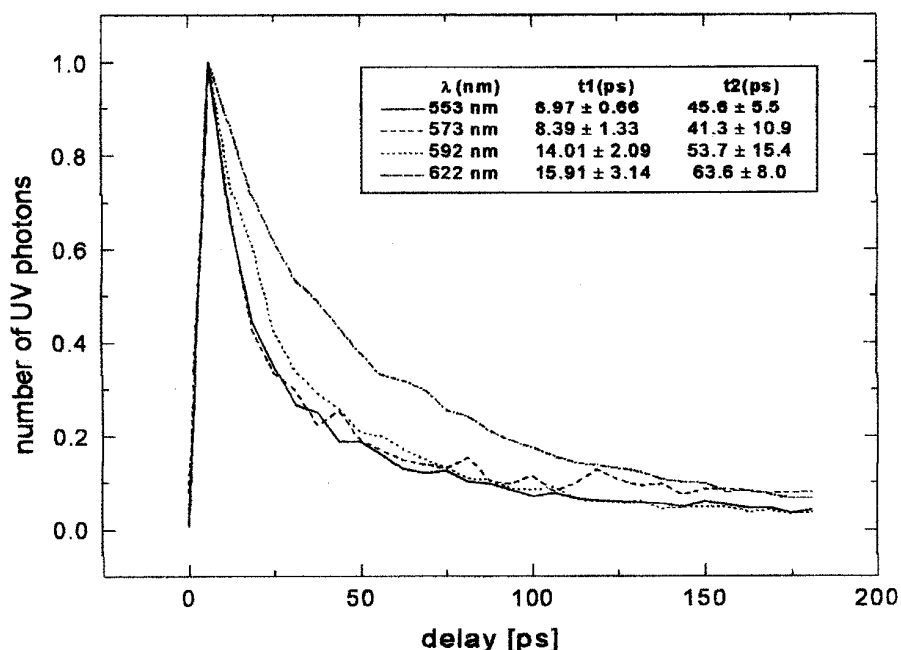


Figure 2
Fluorescence intensity in up-converted UV photons of the polytiophen in chlorophorm at different wavelengths

Dynamics of polytiophens seems to be dependent on the wavelength. The shorter wavelength results in shorter relaxation time, due fast intramolecular process. The longer wavelength results in the longest relaxation time due to stabilization on the ground vibrational state.

- [1] A. H. Zewail, *Femtochemistry- Ultrafast Dynamics of the Chemical Bond*. Volume I, World Scientific Publishing Co., Inc. New Jersey, 1994.
- [2] M. L. Horng, J.A. Gardecki, A. Papazyan, M. Maroncelli, *J. Phys. Chem.*, **1995**, *99*, 17311.
- [3] D. Velic, A. Hotzel, M. Wolf, G. Ertl, *J. Chem. Phys.*, **1998**, *109*, 9155.
- [4] Parasassi T., Destasio G., Rusch R.M., Gratton E., *Biophys. J.*, **1991**, *59*, 466.