



*Electronic Processes in Organic and
Inorganic Materials
(ICEPOM-12)*

**June 1 - 5, 2020
Kamianets-Podilskyi, Ukraine**

With support of
**Taras Shevchenko National University of Kyiv
Institute of Physics, NASU
Kamianets-Podilskyi National Ivan Ohienko University**



ICEPOM-12
Conference abstracts

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STUDY OF EXCITED STATE RELAXATION IN SUBSTITUTED POLYENES BY TIME-RESOLVED ELECTRON SPECTROSCOPY (TRES)

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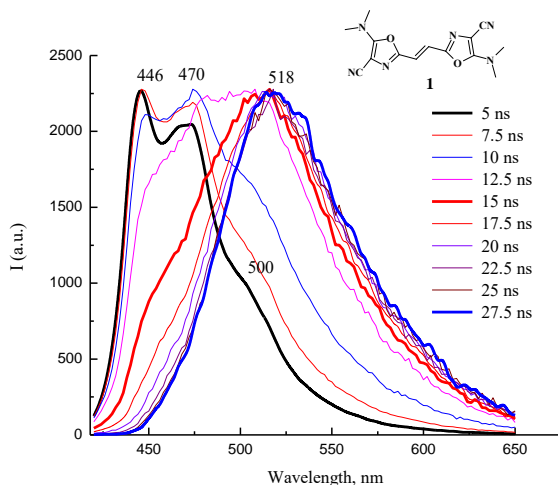
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In the neutral polyenes, presented in our investigation, with their equalized atomic charges and alternated bond lengths, the excitation causes firstly the change of the bond lengths; thus, the polyenes demonstrated the considerable Stock's shifts. Change of bond lengths is a result of relaxation in the excited state and can be accompanied by appreciable spectral effects.

The changes in the time-resolved electronic spectra (TRES) could be strictly connected with the changes in the electron structure when going from ground state to the excited spectra. We have restricted only by the low temperature spectra in the strong polar solvent, when the conformational (vibrational) transitions are no possible. The measured TRES of neutral polyene with 1,3-oxazole terminal groups shown in figure.



One can well-defined see that fluorescence spectrum of molecule undergo essential transformation during life-time flow. The appreciable regular changes in time-resolved spectra points unambiguously on the complicated relaxation path of the dye molecule 1 in the excited state, including the appearance of the speed component and appearance of additional long-time component. The appearance of the fast component is directly connected with the considerable redistribution

of the electron densities at the carbon-carbon bonds upon the unchanged geometry; it disappears after the finished symmetrical relaxation; then time-resolved spectra correspond to the steady fluorescence. Also, in report, the quantum-chemical treatment of relaxation path is discussed, in detail.

N

Nadtoka O.	97, 281, 298, 301, 303	Nedilko S.A.	201
Nagorna T.V.	136	Nedilko S.G.	52, 250
Nalyvaiko V.	300	Negriyko A.M.	105
Naoui Y.	250	Nesin S.	122
Nasiri S.	315	Nessin S.	326
Nasser H.	189, 343	Nikitchuk O.	263
Narbutaitis E.	248	Nikitenko V.M.	77
Naumenko A.P.	5, 11, 12, 98, 101, 116, 123, 137, 279	Nikolaeva O.A.	269, 271, 293
Navozenko A.	12	Nikolaiev R.O.	251
Navozenko O.M.	137, 341	Nikolenko A.	27, 29
Nazar A.P.	267	Nicorici V.	76
Nazarov A.	249	Nosenko V.	318
Nazarov A.N.	67	Nosenko V.V.	252
Nazarova T.	249	Noskov Yu.	139, 173

O

Obernikhina N.V.	26, 131	Olenych Yu.I.	138
Oblovatna S.	75	Oliinyk Y.	28
Obukhova O.	21	Oliynyk V.	257
Obushak M.	256	Oliynyk V.V.	130
Ogurtsov N.	139, 257	Omastova M.	134
Ogurtsov N.A.	173, 324	Omieliaeva V.	297
Ogurtsov V.	287	Onanko A.P.	97, 100, 103
Ohulchanskyy T.Y.	37, 269, 293, 302	Onanko Y.A.	97, 100
Okovytyy S. I.	33	Oranska O.I.	210
Okrushko E.	304, 309	Orel S.	124
Okulov S.M.	252	Orujlu E.N.	253
Okushko O.	300	Ostapenko N.	254
Oleksenko L.P.	244, 247	Ostapenko Yu.	254
Olenchuk M.	27	Ovdenko V.	161, 168, 218, 221
Olenych I.B.	138	Ovsiienko I. V.	147

P

Pak V.	299	Pavlov V.	62, 87, 218, 221
Paluszkiwicz C.	29	Pavlova S.	169, 195
Panasenko A. I.	224	Pavlusiak N.	249
Pancheva H.	259	Pashchenko A.V.	238
Papadopoulos A.	52	Pashkevich Yu.	124
Pashazadeh R.	206	Pashynska V.	305
Pavlenko V.	235	Patoka V. I.	133
Pavlov E.	3	Pavlenko O.L.	22, 97, 100
Pavlov I.	160, 169, 189, 195, 343	Pavlenko T.V.	83

E. S. Veligina, N. V. Obernikhina, O. D. Kachkovsky, V. S. Brovarets ENHANCED DNA RAMAN MODES PROBED BY SiO ₂ PHOTONIC CRYSTALS	27
M. Olenchuk, T. Hanulia, O. Perederii, A. Nikolenko, G. Dovbeshko DEVELOPMENT OF AN EFFECTIVE METHOD OF MANURE CLEANING ON PIG COMPLEXES USING HIGH-VOLTAGE ELECTRIC-PULSE EQUIPMENT	28
A. Chmil, Y. Oliinyk INFRARED AND CARS SPECTROSCOPY STUDY OF MITOCHONDRIA	
I. Polovyi, N. Piergies, C. Paluszkiewicz, A. Dementjev, O. Gnatyuk, A. Nikolenko, G. Dovbeshko SELF-ASSEMBLED PORPHYRIN AGGREGATES ON BIOPOLYMER SURFACE AS A PLATFORM FOR LIGHT HARVESTING AND ENERGY TRANSFER	29
O. Ryazanova, I. Voloshin, A. Glamazda, L. Dubey, M. Ilchenko, I. Dubey, V. Karachevtsev HIGH- AND LOW- ENERGY IONIZING RADIATION EFFECT ON THE BIOLOGICALLY RELEVANT AMINO ACID VALINE MOLECULE	30
A. Snegursky, E. Tamuliene, V. Vukstich, T. Snegurskaya, E. Romanova COUMARIN BASED DONOR-ACCEPTOR DYES FOR DYE-SENSITIZED SOLAR CELLS. THEORETICAL INVESTIGATION	31
Stepaniuk D.S., Blazhynska M.M., Kalugin O.N., Kovalenko S.M., Kyrychenko A.V., Miannay F.-A., Idrissi A., Ivanov V.V. ELECTRONIC PROPERTIES OF 1,2,4-TRIAZOLE DERIVATIVES: A DFT STUDY	32
O. O. Pylypenko, S. I. Okovytyy, L. K. Sviatenko, T. Sergeieva, S. I. Kovalenko FORMATION OF ION ASSOCIATES IN THE CARRAGEENAN - PINACYANOL SYSTEM	33
Iryna Syrotynska, Dorota Ziółkowska, Jan Lamkiewicz TOWARDS THE UNDERSTANDING OF NAD(H) COENZYME FLUORESCENCE AT AMBIENT CONDITIONS	34
Yuliya Terentyeva ^a , Anastasiia Rashevskaya CD SENSITIVITY OF THE MONO-CARBOXYPHENYLSULFIDE IRON(II) CLATHROCHELATES TO GLOBULAR PROTEINS	35
N. Chornenka, S. Vakarov, E. Gumienna-Kontecka, Y. Voloshin, V Kovalska THE SPECTRAL MANIFESTATIONS OF INTERACTION BETWEEN DNA AND METAL IONS	36
Gryn D.V., Yashchuk V.M., Ohulchanskyy T.Y., Doroshenko I.P. COMPARISON OF SORBENTS FOR THE REMOVAL OF ORGANIC COMPOUNDS THAT INTERFERE WITH THE DETERMINATION OF BROMIDE IONS IN NATURAL WATERS	37
O.V. Zuy, Yu.I. Mazna SECTION 2. Electro-optic processes in liquid-crystal-based heterogeneous systems SPECTROSCOPIC STUDY OF SELF-ASSEMBLING PROCESSES IN AQUEOUS SOLUTIONS OF LYOTROPIC LIQUID CRYSTALS	38
	40