

**International symposium**  
**“Modern trends in organometallic chemistry and catalysis”**  
**dedicated to the 90th anniversary**  
**of the academician M. E. Vol’pin**

**A.N. Nesmeyanov Institute of Organoelement Compounds RAS**  
**Russian Academy of Sciences**  
**Division of Chemistry and Material Sciences**  
**Russian Foundation for Basic Research**

Dear colleague,

On behalf of the Organizing Committee we are glad to welcome you at the International symposium "Modern trends in organometallic chemistry and catalysis" dedicated to the 90<sup>th</sup> anniversary of the academician Mark E. Vol'pin. We cordially thank you for your goodwill to participate in this symposium and thus to pay tribute to Professor Vol'pin's memory. Professor Vol'pin was a highly popular figure within the international scientific community due to his utmost scientific reputation, lecturer's gift and, last but not least, communicability and charisma. These personal qualities in combination with Professor Vol'pin's organizational skills finely decorated conferences arranged under his chairmanship or with his participation.

We hope this symposium will reflect current advances of organometallic, catalytic and bioinorganic chemistry, as well as material science, and hence will be a significant and bright scientific event. The organizers aimed to bring together the leading international and Russian chemists to present the latest important achievements in the field and to exchange their views for the future. At the same time we hope the Symposium will keep some intimacy to allow easy contact between young and experienced scientists. The symposium takes place at the Institute of Organoelement Compounds (INEOS), where M. Vol'pin carried out all his glorious studies. The beginning of June is a season both good weather and many interesting cultural events in Moscow. We strongly hope your stay in Moscow will be fruitful and pleasant.

**Symposium co-chairmen**

Yuri N. Bubnov

Aziz M. Muzafarov

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## Professor Mark E. Vol'pin

23.05.1923 – 28.09.1996



Mark Efimovitch Vol'pin was a chemist of genius and one of Russia's leading scientists. He started his career as an organic chemist, then moved into organometallic chemistry, and ended it in bio-organic chemistry. From 1988 he was the director of the A.N. Nesmeyanov Institute of Organoelement Compounds (INEOS) of the Russian Academy of Sciences.

Vol'pin came from a medical background but, after service during the Second World War, he graduated in Chemistry from Moscow State University in 1949. He first became well-known in the West in the mid-1950s for his studies on the chemistry of tropylium, a remarkable organic compound with seven carbons in a ring, bearing a positive charge, which was isolable due to its 6-electron "aromatic" character. Despite this relative stability it was still highly reactive, and indeed Vol'pin was badly injured during experiments with the perchlorate salt.

He later expanded the chemistry of such organic positively charged ions to the 3-membered ring, 2-electron analogues. For that work he was awarded the Lenin Prize in 1963. Deriving from this he became interested in the highly reactive unsaturated single carbon species called carbenes, which in turn led him to investigate related systems, including some highly reactive and unsaturated metal complexes.

An interesting sidelight on the path of pure scientific research in the hands of a master like Vol'pin is seen in his progression from organic chemistry to a most remarkable discovery in inorganic chemistry: a metal complex with the ability to "fix" atmospheric nitrogen under very mild conditions. Nitrogen itself is a major inert component of the air we breathe. By contrast, compounds in which nitrogen is fixed, such as amino acids, ammonia, and nitrates, are reactive substances and form a vital part of both biological and commercial-industrial life.

The only previous ways to fix nitrogen - in other words to turn it from an inert gas into a useful substance - were biological, which had severe limitations, or by the use of very high temperatures and extreme conditions. The catalytic system that Vol'pin and V.B. Shur developed offered a signpost to many other workers.

For this research Vol'pin was awarded the USSR State Prize in 1982, as well as numerous other honours, and was elected to full membership of the USSR Academy of Science in 1987.

In his later work he studied biological metal complexes that could generate very active species, in this case free radicals. The object of these researches was to find compounds that were absorbed by tumours and would destroy them without harming healthy tissue. He felt that this work represented his most satisfying achievement.

In 1980 he was invited to Britain as Centenary Lecturer of the Royal Society of Chemistry. This journey was a major event as the Soviet authorities made it extremely difficult for scientists in general, and Jewish ones in particular, to visit their western counterparts.

In 1979 the Portuguese Academy had invited Vol'pin to attend a major conference on nitrogen fixation in Lisbon. Vol'pin did not arrive at the opening and when the organiser enquired where he was, he discovered that the officials at the USSR Academy had not seen fit to process the travel application. The President of the Portuguese Academy, a retired general, made sure that a loud and clear message got through from the Portuguese Embassy in Moscow to the USSR Academy of Sciences. Travel documents were issued immediately and Vol'pin arrived in Lisbon late but still in time to meet and address his colleagues. Against that background it was indeed surprising that he managed to come to Britain as Centenary Lecturer, and only a year late.

Unfortunately his tribulations at the hands of the Soviet bureaucracy continued. In 1984 he left the final banquet of the International Symposium on Homogeneous Catalysis in Leningrad with a jaunty step on his way to a conference in France. However, he never got there, and when he reappeared in Moscow some days later he would not comment on what had happened in the interim. One didn't ask too many questions; even in 1984 these were everyday problems. Hindsight today suggests that it was the intolerance of the Communist system towards any independent-minded person, rather than his Jewish origins, that caused even a wholly non-political man like Vol'pin to suffer.

Vol'pin was a tall youthful-looking man with a ready smile. He was always cheerful and had a warm firm handshake, even though he had lost several of his fingers in an explosion. He was a most convivial companion, and much enjoyed entertaining friends and visitors. He greatly appreciated cultural events, theatres and concerts, but also good food, dancing and the occasional vodka; indeed, under his tutelage the foreign visitor soon learnt to offer toasts to "Anglo-Russian friendship", to "scientific understanding", and especially to "the ladies" present.

In his later career he was the intellectual powerhouse that drove the research staff of INEOS by example and inspiration. Characteristically he ran a relatively small group himself and did not have his name on all the Institute publications, as was the custom elsewhere. He was a very approachable, gentle and nice man; and he was appointed Director on three separate occasions.

Peter Maitlis

The Independent, 25 October 1996

	June 2 Sunday	June 3 Monday	June 4 Tuesday	June 5 Wednesday	June 6 Thursday	June 7 Friday
9:00		Opening ceremony Volpin memorial	Uwe Rosenthal PL-5	Takashi Ooi PL-8	Manfred Bochmann PL-10	Holger Braunschweig PL-11
9:10						
9:20		Vladimir Shur PL-1	Irena Akhrem PL-6	King Kuok Hii IL-7	Igor Fedushkin IL-9	Mikhail Egorov PL-12
9:30						
9:40		Paul Chirik PL-2	Rinaldo Poli IL-4	Michael North IL-8	Maxim Sokolov O-20	
9:50					Marat Khusniyarov O-21	
10:00				sponsors presentation		
10:10				Coffee-break	Coffee-break	
10:20						Detlef Heller O-32
10:30						sponsors presentation
10:40						Coffee-break
10:50						
11:00						
11:10		Michael Fryzuk PL-3	Christophe Coperet IL-5	Irina Beletskaya PL-9	Young scientists session (15 min talks)	Dmitry Valyaev O-33
11:20						
11:30		Alexander Kudinov O-1	Alexander Trifonov IL-6	Martin Albrecht O-16	Vadim Ermolaev Y-1 Diana Aleksanyan Y-2	Valentin Ananikov IL-10
11:40					Alexander Romanov Y-3	
11:50		Jitendra Bera O-2	Dmitry Roitershtein O-9	Andrew Malkov O-17	Maria Babak Y-4 Ivan Grishin Y-5	Closing ceremony
12:00						
12:10		Sergey Konchenko O-3	Oleg Ozerov O-10	Francis Verpoort O-18	Igor Golub Y-6 Alexander Novikov Y-7	
12:20						
12:30		Alexander Pasynskii O-4	Mikhail Nechaev O-11	Dmitry Zarubin O-19	Artem Zemtsov Y-8	
12:40						
12:50						
13:00						

13:10		Lunch	Lunch	Lunch	Lunch	Lunch
13:20						
13:30						
13:40						
13:50						
14:00	Registration					
14:10						
14:20						
14:30		Ian Manners PL-4	Vladimir Minkin PL-7		Oleg Temkin O-22	
14:40					Mikhail Minyaev O-23	
14:50						
15:00						
15:10		Pierre Dixneuf IL-1	Agusti Lledos O-12		Tatiana Kochina O-24	
15:20						
15:30			Sergey Vyboishchikov O-13		Vadim Negrebetsky O-25	
15:40		Sergey Vatsadze O-5			Larisa Leites O-26	
15:50			Oleg Filippov O-14			
16:00		Alexandre Golub O-6			Alexander Shestakov O-27	
16:10						
16:20		Coffee-break		Sergey Ketkov O-15	Coffee-break	
16:30	WELCOME PARTY			Coffee-break + Poster session		
16:40		Philippe Schollhammer IL-2				
16:50					Ludmila Parfenova O-28	
17:00						
17:10		Alexander Kotelnikov IL-3			Tatiana Tyumkina O-29	
17:20						
17:30					Galina Loukova O-30	
17:40		Elena Milaeva O-7				
17:50		Alexey Nazarov O-8			Elena Evstigneeva O-31	
18:00						
18:10					<b>19:00</b> Banquet	

## Symposium Program

### Sunday, June 2

14:00 Registration

16:00 Welcome party

### Monday, June 3

9:00 Opening ceremony

9:30 ON THE PATH TO CATALYSTS FOR THE LOW-TEMPERATURE  
AMMONIA SYNTHESIS. RESULTS AND PROSPECTS

**V.B. Shur**, S.M. Yunusov, E.S. Kalyuzhnaya

10:10 DINITROGEN FUNCTIONALIZATION AS A ROUTE TO ORGANIC  
MOLECULES

**P.J. Chirik**

10:50 Coffee break

11:10 ORGANOMETALLIC APPROACHES TO NITROGEN FIXATION

**M.D. Fryzuk**, F. Pick, A. Yeo

11:50 NEW INSIGHTS INTO THE CpRu CHEMISTRY

**A.R. Kudinov**, D.S. Perekalin, E.E. Karslyan, E.A. Trifonova,  
N.L. Loskutova, A.S. Romanov, D.V. Muratov

12:10 N-HETEROCYCLIC CARBENE (NHC) ON A DIRUTHENIUM(I)  
PLATFORM: DIRECTED SYNTHESIS AND CATALYTIC EVALUATION

**J.K. Bera**

12:30 TRANSFORMATION OF A CP\*-P MOIETY IN THE COORDINATION  
SPHERE OF MANGANESE CARBONYL COMPLEXES

**S.N. Konchenko**, N.A. Pushkarevsky, M. Scheer

12:50 CHEMICAL DESIGN OF CHALCOGEN-CONTAINING  
ORGANOMETALLIC CLUSTERS

**A.A. Pasynskii**, Yu.V. Torubaev, I.V. Skabitsky, S.S. Shapovalov,  
A.V. Pavlova

13:10 Lunch

14:30 FROM STRAINED METALLORINGS TO FUNCTIONAL  
METALLOPOLYMERS

**I. Manners**



- 15:10 RUTHENIUM(II) CATALYSTS FOR INNOVATION IN C-H BOND  
ACTIVATION AND FERROCENE CHEMISTRY  
**P.H. Dixneuf**
- 15:40 SUPRAMOLECULAR GELS AND METALLOGELS  
**S.Z. Vatsadze**, A.V. Medvedko, V.N. Nuriev
- 16:00 FROM SINGLE MOLYBDENUM DISULFIDE LAYERS TOWARDS  
NANOHYBRID STRUCTURES  
**A.S. Golub**, N.D. Lenenko
- 16:20 Coffee break
- 16:40 ADVANCES AND PERSPECTIVES IN BIOINSPIRED ORGANOMETALLIC  
CHEMISTRY RELATED TO THE ACTIVE SITE OF [FE-FE]  
HYDROGENASES  
**P. Schollhammer**
- 17:10 SYNTHESIS AND BIOLOGICAL PROPERTIES OF FULLERENE BASED  
HYBRID NANOSTRUCTURES  
**A.I. Kotelnikov**, R.A. Kotelnikova, V.S. Romanova
- 17:40 TARGET-FOCUSED DESIGN AND SYNTHESIS OF METAL-BASED  
PHYSIOLOGICALLY ACTIVE COMPOUNDS  
**E.R. Milaeva**
- 18:00 NOVEL RUTHENIUM(II)-ARENE ANTICANCER COMPOUNDS TO  
INTERFERE WITH CELLULAR PROCESSES  
**A.A. Nazarov**, P.J. Dyson, E.R. Milaeva, N.S. Zefirov

#### **Tuesday, June 4**

- 9:00 METALLOCENE MADE MAD METALLACYCLES IN SYNTHESIS AND  
CATALYSIS  
**U. Rosenthal**
- 9:40 SUPERELECTROPHILES OF A NEW GENERATION FOR SP<sup>3</sup> C-H BOND  
FUNCTIONALIZATION OF ALKANES AND FUNCTIONAL ORGANIC  
COMPOUNDS  
**I. Akhrem**
- 10:20 POLYMER-SUPPORTED PHOSPHINES BUILT BY CONTROLLED RADICAL  
POLYMERIZATION AND THEIR APPLICATION TO  
HYDROFORMYLATION CATALYSIS  
**R. Poli**, A.F. Cardozo, E. Manoury, C. Julcour, J.-F. Blanco, H. Delmas,  
F. Gayet

- 10:50 Coffee break
- 11:10 CONTROLLED SURFACE FUNCTIONALISATION TOWARDS WELL-DEFINED HETEROGENEOUS CATALYSTS  
**C. Coperet**
- 11:40 LANTHANIDE COMPLEXES FOR CATALYTIC FORMATION OF C-N, C-P AND C-C BONDS  
**A.A. Trifonov**
- 12:10 HETEROMETALLIC LANTHANIDE – ALUMINIUM COMPLEXES DERIVED FROM LANTHANIDE TRIPHENYLACETATES, STRUCTURE, REACTIVITY AND CATALYTIC ACTIVITY  
**D.M. Roitershtein**, A.A. Vinogradov, K.A. Lyssenko, I.V. Anan'ev, I.E. Nifant'ev
- 12:30 REACTIVITY OF UNSATURATED CATIONIC PINCER COMPLEXES OF GROUP 10 METALS  
**O.V. Ozerov**
- 12:50 EXPANDED RING N-HETEROCYCLIC CARBENES AS SUPER-DONOR LIGANDS. SYNTHESIS, STRUCTURE, APPLICATIONS IN CATALYSIS  
**M.S. Nechaev**, A.F. Asachenko, P.B. Dzhevakov, O.S. Morozov, M.A. Topchiy, M.S. Rubina, K.R. Sorochkina
- 13:10 Lunch
- 14:30 NEW MECHANISMS OF THE INTRAMOLECULAR SPIN-STATE SWITCHING REARRANGEMENTS OF METAL COORDINATION COMPOUNDS  
**V.I. Minkin**
- 15:10 ONE THOUSAND AND ONE WAYS TO BREAK THE H-H BOND  
**A. Lledos**, P. Vidossich, R. Mas-Balleste
- 15:30 ACTIVATION OF H-H AND SI-H BONDS BY BORANES  
**S.F. Vyboishchikov**, G.I. Nikonov, O.G. Shirobokov
- 15:50 DIHYDROGEN BONDS IN TRANSITION METAL CHEMISTRY: THE NATURE, DIRECTIONALITY AND THE ROLE OF METAL ATOM  
**O.A. Filippov**
- 16:10 MODERN APPLICATIONS OF GAS-PHASE HIGH-RESOLUTION LASER IONIZATION SPECTROSCOPY IN ORGANOMETALLIC CHEMISTRY  
**S.Yu. Ketkov**
- 16:30 Coffee break + Poster session

### Wednesday, June 5

9:00 ION-PAIRED CHIRAL LIGANDS FOR ASYMMETRIC PALLADIUM CATALYSIS

**T. Ooi**

9:40 HETEROFUNCTIONALISATION OF C=C BONDS BY Ag CATALYSIS

**K.K. Hii**

10:10 SUSTAINABLE CATALYSIS

**M. North**

10:40 Sponsor presentation

10:50 Coffee break

11:10 NEW TRENDS IN CATALYSIS BY TRANSITION METAL COMPLEXES

**I.P. Beletskaya**

11:50 IMPLICATIONS OF MESOIONIC CARBENES IN OXIDATION CATALYSIS

A. Petronilho, D. Canseco-Gonzalez, **M. Albrecht**

12:10 PALLADIUM CATALYSED INTRAMOLECULAR ALLYLIC C-H AMINATION IN THE SYNTHESIS OF 1,3-AMINO ALCOHOLS AND 1,3-DIAMINES

**A.V. Malkov**, D.S. Lee, M. Barlog, P. Kocovsky

12:30 LATENT OLEFIN METATHESIS SUITABLE FOR INDUSTRIAL APPLICATIONS

**F. Verpoort**

12:50 N-SULFINYLAMINES IN THE REACTIONS OF HETEROMETATHESIS: HETEROGENEOUS VS HOMOGENEOUS CATALYSIS

**D.N. Zarubin**, P.A. Zhizhko, A.A. Znizhin, N.A. Ustynyuk

13:10 Lunch

14:30 Excursion

### Thursday, June 6

9:00 ADVANCES IN GOLD(III) CHEMISTRY: HYDRIDES, PEROXIDES AND OLEFIN COMPLEXES

**M. Bochmann**

9:40 GROUP 13 METAL COMPLEXES OF REDOX-ACTIVE LIGANDS IN CATALYTIC FUNCTIONALIZATION OF ALKYNES

**I.L. Fedushkin**

- 10:10 NOBLE METALS COMPLEXES WITH POLYOXOMETALATES – NEW FIELD IN THE NOBLE METAL CHEMISTRY  
**M.N. Sokolov**, S.A. Adonin, P.L. Sinkevich, P.A. Abramov
- 10:30 PHOTOMAGNETIC MOLECULAR SWITCHES: TRANSITION METAL COMPLEXES WITH PHOTOISOMERIZABLE LIGANDS  
**M.M. Khusniyarov**
- 10:50 Coffee break
- 11:10 PHOSPHONIUM SALTS WITH DIFFERENT CATION STRUCTURE AS PALLADIUM NANOPARTICLES STABILIZER IN SUZUKI REACTION  
**V.V. Ermolaev**, D.M. Arkhipova, V.A. Miluykov, E.E. Zvereva, I.Kh. Rizvanov, O.G. Sinyashin
- 11:25 CYCLOPALLADATION IN ORGANOTHIOPHOSPHORUS PINCER SYSTEMS: SOLUTION AND SOLID STATE STUDIES  
**D.V. Aleksanyan**, V.A. Kozlov
- 11:40 PROTONATION OF THE CYCLOHEXADIENYL COMPLEXES OF THE IRON SUBGROUP METALS. SYNTHESIS AND STRUCTURES  
**A.S. Romanov**, D.V. Muratov, A.R. Kudinov
- 11:55 HOW TO FIND THE NEEDLE IN THE HAYSTACK: TARGET PROFILING OF RAPTA DRUGS BY CHEMICAL PROTEOMICS  
**M.V. Babak**, S.M. Meier, K. Huber, G. Superti-Furga, B.K. Keppler, P.J. Dyson, C.G. Hartinger
- 12:10 THE TANDEM USE OF MALDI-TOF MS AND CYCLIC VOLTAMMETRY FOR ANALYSIS OF ORGANOMETALLIC COMPOUNDS AND INVESTIGATION THEIR REACTIVITY  
**I.D. Grishin**
- 12:25 DIHYDROGEN BONDING AND ACTIVATION OF BH BONDS IN TRANSITION METAL TETRAHYDROBORATES  
**I.E. Golub**, O.A. Filippov, E.S. Shubina
- 12:40 THEORETICAL STUDY OF N-HETEROCYCLIC AMINOXYCARBENES FORMATION AND DECOMPOSITION VIA METAL-ASSISTED [2 + 3]-DIPOLAR CYCLOADDITION AND RETRO-CYCLOADDITION  
**A.S. Novikov**, M.L. Kuznetsov, A.I. Dementiev
- 12:55 REACTIONS OF DIFLUOROCARBENE WITH ORGANOZINC REAGENTS  
**A.A. Zemtsov**, V.V. Levin, M.I. Struchkova, A.D. Dilman
- 13:10 Lunch

- 14:30 OLEFINS OXIDATION. SOME NEW ASPECTS OF OLD REACTION  
**O.N. Temkin**
- 14:50 TETRAPHENYLETHENIDE COMPLEXES OF RARE-EARTH METALS  
**M.E. Minyaev**, D.M. Roitershtein, J.E. Ellis, K.A. Lyssenko, P.A. Belyakov
- 15:10 NUCLEOGENIC TRICOORDINATE CATIONS OF THE 14<sup>TH</sup> GROUP  
ELEMENTS  
**T.A. Kochina**, A.A. Alferova, V.V. Avrorin, E.N. Sinotova
- 15:30 APPLICATION OF DYNAMIC NMR SPECTROSCOPY IN CHEMISTRY OF  
HYPERCOORDINATED SILICON: OPPORTUNITIES  
AND PROSPECTS  
**V.V. Negrebetsky**
- 15:50 NONBENZENOID AROMATIC SYSTEMS WITH PARTICIPATION  
OF A METAL ATOM. VIBRATIONAL SPECTRA AND QUANTUM  
CHEMISTRY STUDY  
**L.A. Leites**, R.R. Aysin, S.S. Bukalov
- 16:10 THEORETICAL STUDY OF ARRANGEMENT, ELECTRONIC STRUCTURE  
AND LUMINESCENT PROPERTIES OF RARE EARTH METAL COMPLEXES  
**A.F. Shestakov**
- 16:30 Coffee break
- 16:50 ASYMMETRIC CARBO- AND CYCLOALUMINATION OF ALKENES  
BY ORGANOALUMINUM COMPOUNDS, CATALYSED WITH  
ENANTIOMERICALLY PURE ZIRCONOCENE COMPLEXES  
**L.V. Parfenova**, L.M. Khalilov, U.M. Dzhemilev
- 17:10 STRUCTURE AND CONFORMATION BEHAVIOR OF SUBSTITUTED  
ALUMINACYCLES  
**T.V. Tyumkina**, L.V. Parfenova, L.M. Khalilov, U.M. Dzhemilev
- 17:30 PHOTOPHYSICS AND PHOTOCHEMISTRY OF ORGANOMETALLIC  
COMPLEXES: MODERN TRENDS IN PHOTONICS  
OF D<sup>0</sup> METALLOCENES  
**G.V. Loukova**
- 17:50 ELEMENTARY REACTIONS OF ALLYLIC COMPLEXES OF Pd(IV)  
GENERATED BY ADDITION OF SUPERELECTROPHILIC H<sub>3</sub>O<sub>2</sub><sup>+</sup>  
TO Pd(II) PRECURSORS  
**E.M. Evstigneeva**
- 19:00 Conference banquet

**Friday, June 7**

9:00 SINGLE, DOUBLE, TRIPLE, CHAINS NEW FORAYS INTO BORON-BORON-BOND FORMATION

**H.B. Braunschweig**

9:40 CYCLOADDITION REACTIONS OF CARBENE ANALOGUES

**M.P. Egorov**

10:20 Rh-COMPLEXES IN HOMOGENEOUS CATALYSIS - CATALYST DEACTIVATION

**D. Heller**, H.-J. Drexler, C. Kohrt, A. Meiner

10:40 Sponsor presentation

10:50 Coffee break

11:10 MANGANESE ALPHA-P-SUBSTITUTED FISCHER CARBENES AS POTENTIAL SYNTHONS IN ORGANOPHOSPHOROUS CHEMISTRY

**D.A. Valyaev**, K.I. Utegenov, N. Lugan, G. Lavigne, N.A. Ustynyuk

11:30 PALLADIUM AND GOLD CATALYSTS: WHAT IS DIFFERENT?

**V.P. Ananikov**

12:00 Closing ceremony