

CURRICULUM VITAE

Oleg G. Poluektov

Oleg G. Poluektov, Ph.D.
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EDUCATION

1974-1980 Moscow Institute of Physics and Technology, Department of Chemical Physics
MS with high honor (GPA 5.0, on the scale of 5)
1980-1983 Postgraduate study at Moscow Institute of Physics and Technology and Institute of
Chemical Physics, RAS. PhD, Chemical Physics, Advisor: Prof. Ya. S. Lebedev, Title:
“Molecular Dynamics as Studied by High Field (140 GHz) EPR Spectroscopy”

POSITIONS HELD

2015- present Senior Chemist, Argonne National Laboratory, Chemical Sciences and Engineering
Division, Argonne, IL, USA
2007- 2015 Chemist, Argonne National Laboratory, Chemical Sciences and Engineering Division,
Argonne, IL, USA
2000-2007 Chemist, Argonne National Laboratory, Chemistry Division, Argonne, IL, USA
1997-1998 Visiting Scientist, Argonne National Laboratory, Chemistry Division, Argonne, IL, USA
1991-1996 Visiting Research Scientist, University of Leiden, The Netherlands
1983-2000 Scientist, Senior Scientist in the Institute of Chemical Physics, Russian Academy of
Science, Moscow, Russia

RESEARCH INTEREST AND EXPERIENCE

2000-present Chemist, Photosynthesis / Solar Energy Conversion Group, Chemical Sciences and
Engineering Division, Argonne National Laboratory

- Structure-function relationships in the photosynthetic reaction center (RC) proteins
- Charge separation in Organic Photovoltaic bulk heterojunction cells
- Role of the RC protein in controlling photosynthetic electron-transfer (ET) and charge separation
- Role of spin chemistry and quantum effects in efficient charge separation in natural and artificial photosynthetic systems
- Biohybrid system for solar fuel production
- Relationship between electronic structure of the organometallic molecular catalysts and their activity
- Electronic structures of photosynthetic ET cofactors by high-frequency (HF) EPR
- Mapping protein dynamics by spin labeling technique
- Mapping ET pathways in: and transient structures of: RC proteins by time-resolved HF

ENDOR

- Development of HF pulsed EPR and ENDOR techniques
- Bio/Inorganic Arrays for Photovoltaic Cells and Biological Sensors
- Directionality of electron transfer in photosystem I.

1997-1998 Visiting Scientist, Photosynthesis Group, Chemistry Division, Argonne National Laboratory

- Time-resolved, pulsed EPR study of the photosynthetic reaction centers
- Development of pulsed EPR instrumentation

1991-1996 Visiting Research Scientist, Group of Prof. J. Schmidt, Huygens Laboratory, University of Leiden

- ODMR (Zero-field, 95 GHz), pulsed, time-resolved very HF (95 GHz) EPR technique, pulsed (95 GHz) ENDOR-technique.
- Time-resolved EPR and ENDOR (95 GHz) of the dynamic properties and structure of the self-trapped exciton and the shallow donor center in AgCl-single crystal. Shallow and deep Boron-acceptor centers in SiC-single crystal.
- Structure and triplet excitations in C₆₀, C₇₀- single crystals. ENDOR (95 GHz) and ESEEM (X-Band) study of the excited C₆₀ triplet states
- First high frequency EPR study of the single crystal of the blue copper protein azurin and its mutants.

1980-1999 Ph.D student, Research Scientist, Senior Scientist, Laboratory of Prof. Ya. S. Lebedev, Institute of Chemical Physics of the Russian Academy of Sciences

- Application of the HF (140 GHz) EPR technique for characterization of molecular mobility: models and anisotropy of molecular reorientational motion in glasses, liquid crystals, proteins and spin polymer systems. Spin probe and spin label technique.
- Polyconjugated systems, irradiated polymers, high-temperature superconductors.
- Development of new methods of HF EPR: EPR imaging, pulsed EPR, multifrequency EPR.
- Correlation between molecular dynamics and kinetics of the chemical reactions.

SYNERGISTIC ACTIVITIES

- Member of the advisory board of the Applied Magnetic Resonance journal.
- Reviewer for the Journal of Physical Chemistry, Journal of Magnetic Resonance, JACS, PNAS, Biophysical Journal, Applied Magnetic Resonance, and Biochemistry.
- Reviewer of DOE and NSF proposals.
- Member of on-site DOE proposal review committee.
- Member of the expert committee of Skolkovo Innovation Center, Russian Federation.

TEACHING EXPERIENCE

1983-1991 Lectures, seminars and laboratories in General Physics in the Moscow Institute of Communication.

LIST OF PUBLICATIONS (journal articles and book chapters)

H-index: 28; Sum of the Times Cited: 2431

155. D. Basu, S. Mazunder, J. Niklas, H. Baydoun, D. Wanniarachchi, X. Shi, R.J. Staples, O.G. Poluektov, H.B. Schlegel, C.N. Verani “Evaluation of the coordination preferences and catalytic pathways of heteroaxial cobalt oximes towards hydrogen generation” *Chemical Science*, DOI: 10.1039/c5sc04214c (2016).
154. K. L. Mardis, J. N. Webb, T. Holloway, J. Niklas, O. G. Poluektov, “Electronic Structure of Fullerene Acceptors in Organic Bulk-Heterojunctions: A Combined EPR and DFT Study”, *J. Phys. Chem. Lett.*, 2015, 6 (23), 47-30-4735.
153. J. Zadrozny, J. Niklas, O. G. Poluektov, D. Freedman, “Millisecond Coherence Time in a Tunable Molecular Electronic Spin Qubit” *ACS Central Science*, **1**, 488-492 (2015).
152. Poluektov, O. G., Utschig, L. M. “Low Temperature Bidirectional Electron Transfer in F_X removed photosystem I”, *J. Phys. Chem. B*, 2015, 119 (43), 13771-13776.
151. R. J. Ellis, T. Demars, G. Liu, J. Niklas, O. G. Poluektov, I. A. Shkrob, “In the Bottlebrush Garden: The Structural Aspects of Coordination Polymer Phases formed in Lanthanide Extraction with Alkyl Phosphoric Acids”, *J. Phys. Chem. B*, 2015, 119 (35), 11910-11927.
150. S. R. Soltau, J. Niklas, P. D. Dahlberg, D. M. Tiede, O. G. Poluektov, K. L. Mulfort, and L. M. Utschig, “Aqueous light-driven hydrogen production by a Ru-Ferredoxin-Co biohybrid”, *Chem. Comm.*, 2015, 51 (53), 10628-10631.
149. J. Niklas, M. Westwood, K.L. Mardis, T. Brown, A. Pitts-McCoy, M.D. Hopkins, O.G. Poluektov, “X-Ray Crystallographic, Multifrequency Electron Paramagnetic Resonance, and Density Functional Theory Characterization of the Ni(P^{Cy}₂N^{tBu}₂)₂ⁿ⁺ Hydrogen Oxidation Catalyst in the Ni(I) Oxidation State”, *Inorganic Chemistry*, 2015, 54 (13), 6226-6234.
148. J. Niklas, S. Beaupré, M. Leclerc, T. Xu, L. Yu, A. Sperlich, V. Dyakonov, O.G. Poluektov, “Photoinduced Dynamics of Charge Separation: From Photosynthesis to Polymer-Fullerene Bulk Heterojunctions”, *J. Phys. Chem. B*, 2015, 119 (24), 7407-7416.
147. J. Camacho-Bunquin, N. A. Siladke, G. Zhang, J. Niklas, O. G. Poluektov, S. T. Nguyen, J. T. Miller, and A. S. Hock, “Synthesis and Catalytic Hydrogenation Reactivity of a Chromium Catecholate Porous Organic Polymer”, *Organometallics*, 2015, 34 (5), 947–952.
146. D. Basu, S. Mazumder, X. Shi, H. Baydoun, J. Niklas, O. Poluektov, H. B. Schlegel, C. N. Verani, “Ligand Transformations and Efficient Proton/Water Reduction with Cobalt Catalysts Based on Pentadentate Pyridine-Rich Environments”, *Ang. Chem. Int. Ed.*, 2015, 54 (7), 2105 –2110.
145. B. Hu, A. Getsoian, N.M. Schweitzer, U. Das, H.S. Kim, J. Niklas, O.G. Poluektov, L.A. Curtis, P.C. Stair, J.T. Miller, A.S. Hock, “Selective Propane Dehydrogenation with Single Site Co(II) on SiO₂ by a Non-redox Mechanism”, *Journal of Catalysis*, 2015, 322, 24-37.
144. J. Zadrozny, J. Niklas, O.G. Poluektov, D. Freedman, “Multiple Quantum Coherences from Hyperfine Transitions in a Vanadium(IV) Complex”, *J. Amer. Chem. Soc.*, 2014, 136, 15841-15844.
143. K.K. Tanabe, M.S. Ferrandon, N.A. Siladke, S.J. Kraft, G. Zhang, J. Niklas, O.G. Poluektov, S.J. Lopykinski, E.E. Bunel, T.R. Krause, J.T. Miller, A.S. Hock, S.T. Nguyen, “Discovery of Highly

Selective Alkyne Semihydrogenation Catalysts Based on First-Row Transition-Metallated Porous Organic Polymers”, *Angew. Chem. Int. Ed.*, 2014, 53 (45), 12055-12058.

142. I.A. Shkrob, A.J. Kropf, T.W. Marin, Y. Li, O.G. Poluektov, J. Niklas, D.P. Abraham, “Manganese in Graphite Anode and Capacity Fade in Li-Ion Batteries”, *J. Phys. Chem. C*, 2014 18, 24335-24348.

141. M. Bacchi, G. Berggren, J. Niklas, E. Veinberg, M.W. Mara, M.L. Shelby, O.G. Poluektov, L.X. Chen, D.M. Tiede, C. Cavazza, M.J. Field, M. Fontecave, V. Artero, “Cobaloxime-Based Artificial Hydrogenases”, *Inorganic Chemistry*, 2014, 53, 8071-8082.

140. J. D. Megiatto, D. D. Méndez-Hernández, M. E. Tejada-Ferrari, A.-L. Teillout, O. G. Poluektov, T. Rajh, V. Mujica, T. L. Groy, D. Gust, T. A. Moore and An. L. Moore, “A bioinspired construct that mimics radical interactions of the Tyr-His pairs of photosystem II”, *Nature Chemistry*, **2014**, 6, 423-428.

139. Poluektov, O. G.; Niklas, J.; Mardis, K. L.; Beaupré, S.; Leclerc, M.; Villegas, C.; Erten-Ela, S.; Delgado, J. L.; Martin, N.; Sperlich, A.; Dyakonov, V. “Electronic Structure of Fullerene Heterodimer in Bulk-Heterojunction Blends”, *Advanced Energy Materials*, **2014**, 4, 1301517.

138. Niklas, J., Holt, J. M., Mistry, K., Rumbles, G., Blackburn, J and Poluektov, O. G. “Charge Separation in SWNT:P3HT Blends Studied by EPR: Spin Signature of the Photoinduced Charged State in SWCNT”, *J. Phys. Chem. Lett.*, 2014, 5, 601-606.

137. S. C. Silver, J. Niklas, P. Du, O. G. Poluektov, D. M. Tiede, L. M. Utschig, “Protein Delivery of a Ni Catalyst to Photosystem I for Light-Driven Hydrogen Production.” *J. Amer. Chem. Soc.*, **2013**, 135, 13246-13249.

136. R. Chatterjee, C. S. Coates, S. Milikisiyants, C-I. Lee, A. Wagner, O. G. Poluektov, and K. V. Lakshmi “High-Frequency Electron Nuclear Double-Resonance Spectroscopy Studies of the Mechanism of Proton-Coupled Electron Transfer at the Tyrosine-D Residue of Photosystem II” *Biochemistry*, 2013, 52 (28), 4781–4790.

135. J. Niklas, K.L. Mardis, B.P. Banks, G.M. Grooms, A. Sperlich, V. Dyakonov, S. Beaupre, M. Leclerc, T. Xu, L. Yu, O.G. Poluektov, “Highly-Efficient Charge Separation and Polaron Delocalization in Polymer-Fullerene Bulk-Heterojunctions: A Comparative Multi-Frequency EPR & DFT Study” *Phys. Chem. Chem. Phys.*, 2013, 15 (24), 9562 – 9574.

134. Antipov, S., Poluektov, O., Schoessow, P., Kanareykin, A., Jing, C. “Photoinduced Spin Polarization and Microwave Technology” *Nuclear Inst. and Methods in Physics Research, A*, 2013, 700, 171-178.

133. Jens Niklas, Kristy L. Mardis, Brian P. Banks, Gregory M. Grooms, Andreas Sperlich, Vladimir Dyakonov, Serge Beaupré, Mario Leclerc, Tao Xu, Luping Yu, Oleg G. Poluektov, “Highly-Efficient Charge Separation and Polaron Delocalization in Polymer-Fullerene Bulk-Heterojunctions: A Comparative Multi-Frequency EPR & DFT Study” *arXiv:1305.6434*, <http://arxiv.org/abs/1305.6434>

132. A. Abouimrane, W. Weng, H. Eltayeb, Y. Cui, J. Niklas, O. Poluektov, and K. Amine “Sodium insertion in carboxylate based materials and their application in 3.6 V full sodium cells” *Energy Environ. Sci.*, 2012, 5, 9632-9638.

131. Donald M. Crokek, Anja Metz, Astrid M. Müller, Harry B. Gray, Toyketa Horton, Dorothy C. Horton, Oleg Poluektov, David Tiede, Ralph T. Weber, William L. Jarrett, Joshua D. Phillips, and Alvin

Holder "A novel ruthenium(II)-cobaloxime supramolecular complex for photocatalytic H₂ evolution: Synthesis, characterisation, and mechanistic studies", *Dalton Trans.*, 2012, 41, 13060-13073.

130. Floyd A. Beckford, Jeffrey Thessing, Alyssa Stott, Alvin A. Holder, Oleg G. Poluektov, Liya Li, Navindra P. Seeram, "Anticancer activity and biophysical reactivity of copper complexes of 2-(benzo[d][1,3]dioxol-5-ylmethylene)-N-alkylhydrazinecarbothioamides", *Inorg. Chem. Comm.*, 2012, 15, 225-229.

129. T. Berthold, E. D. von Gromoff, S. Santabarbara, P. Stehle, G. Link, O. G. Poluektov, P. Heathcote, C. F. Beck, M. C. Thurnauer, and G. Kothe "Exploring the Electron Transfer Pathways in Photosystem I by High-Time Resolution Electron Paramagnetic Resonance: Observation of the B-side Radical Pair P₇₀₀⁺A_{1B}⁻ in Whole Cells of the Deuterated Green Alga *Chlamydomonas reinhardtii* at Cryogenic Temperatures" *JACS*, 2012, 134(12) 5563-5576.

128. R. Chatterjee, C. Coates, S. Milikisiyants, O. G. Poluektov, and K. V. Lakshmi "The Structure and Function of Quinones in Biological Solar Energy Transduction: A High-Frequency D-Band EPR Spectroscopy Study of Model Benzoquinones" *J. Phys. Chem. B*, 2012, 116(1), 676-682.

127. Niklas, J., Mulfort, K. L., Rakhimov, R. R, Mardis, K. L., Tiede, D. M., and Poluektov, O. G. "The Hydrogen Catalyst Cobaloxime – a Multifrequency EPR and DFT Study of Cobaloxime's Electronic Structure" *J. Phys. Chem. B*, 2012, 116(9) 2943-2957.

126. T. I. Smirnova, T. G. Chadwick, V. A. Bankaitis, G. Schaaf, O. G. Poluektov, A. I. Smirnov "Role of Electrostatic and Hydrogen Bonding Environment in Sequestering Lipids from Membranes Into the Sec14 Protein Cavity", *Biophysical Journal*, 2011, 100(3) pp. 552-553.

125. T. J. Savenije, A. Sperlich, H. Kraus, O. Poluektov, M. Heeney, and Vladimir Dyakonov "Observation of bi-polarons in blends of conjugated copolymers and fullerene derivatives" *Phys. Chem. Chem. Phys.*, 2011,13, 16579-16584.

124. L. M. Utschig, N. M. Dimitrijevic, O. G. Poluektov, S. D. Chemerisov, K. L. Mulfort, and D. M. Tiede "Photocatalytic Hydrogen Production from Noncovalent Biohybrid Photosystem I/Pt Nanoparticle Complexes" *J. Phys. Chem. Lett.*, 2011, v. 2(3), 236-241.

123. N. Dimitrijevic, B. Vijayan, O. Poluektov, T. Rajh, K. A. Gray, H. He, P. Zapol, "Role of Water and Carbonates in Photocatalytic Transformation of CO₂ to CH₄ on Titania" *J. Amer. Chem. Soc.*, 2011, v. 133, 3964-3971.

122. Utschig, L. M., Tiede, D. M., and Poluektov, O. G. Light Induced Alteration of Low Temperature Interprotein Electron Transfer Between Photosystem I and Flavodoxin, *Biochem. Communication*, 2010, v. 49(45), 9682-9684.

121. S. Santabarbara, I. Kuprov, O. Poluektov, P. J. Hore, A. Casal, C. A. Russell, S. Purton, and M. C.W. Evans. Directionality of electron transfer reactions in Photosystem I of prokaryotes: universality of the bidirectional electron transfer model, *J. Phys. Chem. B*, 2010. v. 114 (46), 15158-15171.

120. Baranov, P. G., Romanov, N. G., Poluektov O. G., and Schmidt, J. Self-Trapped Excitons in Ionic-Covalent Silver-Halide Crystals and Nanostructures: High Frequency EPR, ESE, ENDOR and ODMR Studies, *Appl. Magn. Reson.*, 2010, v. 39 (4), 453-486.

119. M. Liedtke, A. Sperlich, H. Kraus, C. Deibel, V. Dyakonov, S. Filipponec, J. L. Delgado, N. Martín, O. G. Poluektov. Spectroscopic Signatures of Photogenerated Radical Anions in Polymer-[C70]Fullerene Bulk Heterojunctions, *ECS Transactions*, 2010, v. 28(17), 3-10.
118. O. G. Poluektov, S. Filippone, N. Martín, A. Sperlich, C. Deibel, and V. Dyakonov, "Spin Signatures of Photogenerated Radical Anions in Polymer-[70]Fullerene Bulk-Heterojunctions: High-Frequency Pulsed EPR Spectroscopy", *J. Phys. Chem. B*, 2010, v. 114, 14426–14429.
117. Ponomarenko N.S., Poluektov O.G., Bylina E. J., Norris J.R. "Electronic structure of the primary electron donor of *Blastochloris viridis* heterodimer mutants: High-field EPR study" *Biochimica et Biophysica Acta*, 2010, v. 1797 (9), 1838-1840.
116. Ponomarenko N.S., Poluektov O.G., Bylina E. J., Norris J.R. "Electronic structure of the primary electron donor of *Blastochloris viridis* heterodimer mutants: High-field EPR study" *Biochimica et Biophysica Acta*, 2010, v. 1797, 1617–1626.
115. S. Antipov, P. Schoessow, A. Kanareykin, C. Jing, O. Poluektov, and W. Gai, (2010) Paramagnetic Materials for PASER and Tunable Absorption. In: Gold, S. H., and Nusinovich, G. S., (eds) *Advanced Accelerator Concepts*, Vol. 1299, pp. 653-657, Amer. Inst. Physics, USA.
114. L. M. Utschig, S. D. Dalosto, M. C. Thurnauer, and O. G. Poluektov, "The Surface Metal Site in *Blc. Viridis* Photosynthetic Bacterial Reaction Centers: Cu^{2+} as a Probe of Structure, Location, and Flexibility" *Appl. Magn. Reson.*, 2010, v. 38, 1–17.
113. Schoessow, P., Antipov, S., Kanareykin, A., Jing, C., Poluektov, O. (2009) Microwave PASER Experiment. In: Schroeder, C. B., Leemans, W., and Esarey, E., (eds) *Advanced Accelerator Concepts*, Vol. 1086, pp. 526-531, Amer. Inst. Physics, USA.
112. O. G. Poluektov, S. V. Paschenko, and L. M. Utschig, "Spin-Dynamics of the Spin-Correlated Radical Pair in Photosystem I. Pulsed Time-Resolved EPR at High Magnetic Field." *Phys. Chem. Chem. Phys.* 2009, v. 11, 6750-6756.
111. Poluektov, O. G. and Utschig, L. M. (2009) Protein Environments and Electron Transfer Processes Probed with High-Frequency ENDOR. In: Hunter CN, Daldal, F, Thurnauer MC, and Beatty JT (eds) *The Purple Phototrophic Bacteria. Advances in Photosynthesis and Respiration*, Vol. 28, pp. 155-179, Springer, Dordrecht, The Netherlands.
110. Moore, G. F., Hambourger, M., Gervaldo, M., Poluektov, O. G., Rajh, T., Gust, D., Moore, T. A., and Moore, A. L. A Bioinspired Construct That Mimics the Proton Coupled Electron Transfer between P680^+ and the Tyr_z-His190 Pair of Photosystem II, *J. Am. Chem. Soc.*, 2008, v. 130, 10466–10467.
109. O. G. Poluektov, C-I. Lee, S. Chand, A. Wagner & K. V. Lakshmi "Snapshots of Biological Proton-Coupled Electron Transfer: Electron-Nuclear Double Resonance Spectroscopy of Tyrosine Intermediates in Photosystem II" *Biophys. J.*, 2008, v. 95, 476.
108. Utschig, L. M., Chemerisov, S. D., Tiede, D. M., and Poluektov, O. G. Electron paramagnetic resonance study of radiation damage in photosynthetic reaction center crystals, *Biochem.*, 2008, v. 47, 9251-9257.

107. Utschig, L. M., Chen, L. X., and Poluektov, O. G. Discovery of Native Metal Ion Sites Located on the Ferredoxin Docking Side of Photosystem I, *Biochem.*, 2008, v. 47, 3671–3676.
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105. Ponomarenko, N., Poluektov, O., Li, L., Bylina, E., Ismagilov, R., and Norris, J. Structural aspects of interactions between the primary donor and cytochrome in heterodimer mutant reaction centers of *Blastochloris viridis*, *Photosyn. Res.*, 2007, Vol. 91, 142.
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102. Dimitrijevic, N. M., Saponjic, Z. V., Rabatic, B. M., Poluektov, O. G., and Rajh, T. Effect of Size and Shape of Nanocrystalline TiO_2 on Photogenerated Charges. An EPR Study, *J. Phys. Chem. C Lett.*, 2007, v. 111 (40), 14597-14601
101. Poluektov, O. G., Utschig, L. M., Thurnauer, M. C., and Kothe, G. Exploring Hyperfine Interactions in Spin-Correlated Radical Pairs from Photosynthetic Proteins: High-Frequency ENDOR and Quantum Beat Oscillations, *Appl. Magn. Reson.*, 2007, v. 31 (1-2), 123-143.
100. Smirnova, T. I., Chadwick, T. G., Voinov, M. A., Poluektov, O., van Tol, J., Ozarowski, A., Schaaf, G., Ryan, M. M., and Bankaitis, V. A. Local Polarity and Hydrogen Bonding inside Sec14p Lipid-binding Cavity: High-Field Multifrequency EPR Studies, *Biophys. J.*, 2007, v. 92 (10), 3686-3695.
99. Smirnova, T. I., Smirnov, A. I., Pachtchenko, S., and Poluektov, O. G. Geometry of Hydrogen Bonds Formed by Lipid Bilayer Nitroxide Probes: A High Frequency Pulsed ENDOR/EPR Study, *J. Am. Chem. Soc. (Communication)*, 2007, v. 129 (12), 3476-3477.
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97. Saponjic, Z. V., Dimitrijevic, N. M., Poluektov, O., Chen, L. X., Wasinger, E., Welp, U., Tiede, D., Zuo, X., and Rajh, T. Charge Separation and Surface Reconstruction: A Mn^{2+} Doping Study, *J. Phys. Chem. B*, 2006, v. 110 (50), 25441-25450.
96. Dimitrijevic, N. M., Poluektov, O. G., Saponjic, Z., and Rajh, T. Complex and Charge Transfer between TiO_2 and Pyrroloquinoline Quinone, *J. Phys. Chem. B*, 2006, v. 110 (50), 25392-25398.

95. Smirnova, T. I., Chadwick, T. G., MacArthur, R., Poluektov, O., Song, L., Ryan, M., and Bankaitis, V. A. The Chemistry of Phospholipid Binding by the *Saccharomyces cerevisiae* Phosphatidylinositol Transfer Protein Sec14p as Determined by Electron Paramagnetic Resonance Spectroscopy, *J. Biol. Chem.*, 2006, v. 281 (46), 34897-34908.
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89. Raitsimring, A.M., Astashkin, A. V., Poluektov, O. G., and Caravan, P. High-Field Pulsed EPR and ENDOR of Gd^{3+} Complexes in Glassy Solutions, *Appl. Magn. Reson.*, 2005, v. 28, 281-295.
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87. Thurnauer, M. C.; Dimitrijevic, N. M.; Poluektov O. G., and Rajh, T. Photoinitiated Charge Separation: from Photosynthesis to Nanoparticles, *The Spectrum*, 2004, v. 17(1), 10-15.
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