

Tatiana SHOKHIREVA

Ph.D. in Chemistry, US Citizen

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EMPLOYMENT

1994 - present. F. A. Walker Research Group. Department of Chemistry, University of Arizona, Tucson, AZ. *Bioinorganic Chemistry of Hemes and Heme Proteins; Porphyrin Synthesis, Site-Directed Mutagenesis, Electrochemistry, NMR and EPR Spectroscopies.*

Scientist.

Spectroscopic characterization of heme proteins and model heme systems.

- 2D NMR study of electronic structure, geometric and dynamic properties of paramagnetic proteins - Nitrophorins (1-4).
 - Instruments: Bruker DRX500 and DRX600 and also Varian 300 and Inova 600 spectrometers.
 - 2D NMR techniques: WEFT NOESY, DQF COSY, WEFT ROESY, HMQC, HSQC
 - Data processing: XWINNMR and Custom "Methyl Shift Patterns" program.
- EPR study of electronic and geometrical structure of ferriheme center including axial ligands orientation of ferriheme center.
 - Data were collected on Bruker ESP300E EPR spectrometer in EPR facility of the University of Arizona.
- Spectroelectrochemical study of redox properties of heme proteins.
 - Electrochemical measurements were performed using a BAS CV-500W voltammetric analyzer and Spectral Instruments spectrophotometer.
- Investigation of binding ability of axial ligands in heme proteins by means of optical difference spectrophotometry.
 - Measurements were performed on a Perkin-Elmer lambda-19 spectrophotometer.
- Published over 20 papers in peer review journals.

1986-1993. Laboratory of catalytic reaction of carbon oxides, Institute of Catalysis, Russian Academy of Sciences, Novosibirsk, Russia.

Scientist.

- Research and development of oxide catalysts for oxidation reactions.
 - Developed the production technology of iron-molybdenum oxide catalysts for methanol oxidation.
 - Elaborated the synthesis of heteropolycompounds and studied of their physical and chemical properties by means of IR, EPR and X-ray spectroscopies.
 - Studied heteropolycompounds as catalysts for hydrogenation and oxidations reactions.
 - Investigated the nitric oxide decomposition reactions over oxide catalysts.
- Developed Mo-oxide catalyst for methanol oxidation (USSR patent No 1028353).
- Published over 20 papers in leading scientific journals

RESEARCH INTERESTS

- NMR and EPR study of Fe(III)porphyrins - the model systems of Hemeproteins.
- NMR and EPR study of Heme proteins:
 - Heme center structure and dynamic behavior (including axial ligand rotation, macro cycle inversion and ligand exchange).
 - Effect of the heme center structure on protein physiological functions (binding ability, redox potentials etc.).
- Heterogeneous catalysis: oxidation reactions, oxide catalysts preparation and physico-chemical study by IR, EPR, X-ray spectroscopies.

PUBLICATIONS

Over 40 papers and patents (<http://www.chem.arizona.edu/~shokhirn/tatiana/publications.html>).

INTERNATIONAL COLLABORATION

1990 Visiting Scientist Institute of Kinetics and Catalysis Sofia, Bulgaria.

1991 Visiting Scientist Indian Institute of Chemical Technology, Hyderabad, India.

EDUCATION

Ph.D. Institute of Catalysis, Siberian Branch of the USSR Academy of Sciences, Novosibirsk.
Thesis: "The influence of formation of heteropolycompounds on catalytic properties of oxide molybdenum-contained catalysts".

M.Sc. Novosibirsk State University, Department of Chemistry, Novosibirsk, Russia.

Thesis: "Investigation catalytic properties of Mn-oxide catalysts in oxidation reactions".