TAISIYA (TAYA) SKORINA, Ph.D.

Sr. Materials Chemist
3M Corporate R&D

PROFESSIONAL PROFILE

Over 10 years of research experience in Materials Chemistry and Chemical Engineering. Research focuses on the physical chemistry of silicates, in particular, on resource-efficient synthetic technologies to obtain silicate-based functional inorganic and hybrid materials

RESEARCH

3M Corporate Labs (CRML) **St. Paul, MN**

Sr. Materials Chemist (August 2014 – present**)** Development of functional inorganic silicates-based materials and coatings for various applications. Two inventions are being filed globally in 2016.

Massachusetts Institute of Technology (MIT) **Cambridge, MA**

Postdoctoral Associate (August 2012 – June 2014): Developed an innovative technology to extract potassium from unconventional (low-grade) resource. This multidisciplinary project was aimed at transforming of rock- forming minerals into a fertilizer with controlled rate of nutrient release, and required an expertise in the areas of Geochemistry, Hydrometallurgy, and Minerals Thermodynamics. US Patent US20140345348 A1 has been recently granted (Notice of Allowance has been issued by US Patent and Trademark Office on Jan 25, 2016).

More on this research: https://mpc-www.mit.edu/component/k2/item/392-reconstituting-feldspar-for-fertilizer

Arizona State University (ASU)Tempe, AZ Visiting Scientist (2011-2012): Explored novel synthetic strategy to produce nano-porous sorbents for water remediation focusing on synthetic aluminosilicates. A cost-effective nano-porous sorbent of high sorption capacity was developed and characterized. Techniques used include sol-gel synthesis, powder X-ray diffraction, Raman/IR spectroscopy, surface area and pore size analysis, thermal analysis (DTA/TGA); scanning and transmission electron microscopies, confocal laser scanning microscopy**.**

TEACHING

Massachusetts Institute of Technology **Cambridge, MA**

Taught a short course entitled **"**Silicates in Nature and the Nature of Silicates", Course 3, 2014, Class 3.19

Mendeleev University of Chemical Technology of Russia **Moscow, Russia**

Lecturer (2007- 2011). Lecturing, laboratory work, and final evaluation. Courses: Basics of Heat Transfer; Chemistry and Technology of Cement, Glass, and Ceramics; Physical Chemistry of Silicates; wrote **tutorials** that were published: http://www.asdn.net/asdn/chemistry/silicates.shtml

EDUCATION

Ph.D. in Materials Chemistry (May, 2010), D. Mendeleev University of Chemical Technology of Russia in collaboration with the Department of Material Science in Lomonosov Moscow State University. Thesis title: "Alkali silicate binders: Effect of SiO_2/Na_2O ratio and alkali metal ion type on the structure and

mechanical properties". **M.S.** in Chemical Engineering (with Honors), Mendeleev University of Chemical Technology of Russia, Moscow.

SELECTED PUBLICATIONS

1. Taisiya Skorina and Antoine Allanore. Aqueous alteration of potassium-bearing aluminosilicate minerals: from mechanism to processing ***Green Chem.***, 2015, **DOI:** 10.1039/C4GC02084G

2. Taisiya Skorina and Antoine Allanore. Mechano-hydrothermal alteration of potassium-bearing rock-forming minerals. U.S. Application No.: 61819699, Filing Date: May 6, 2013

3. Skorina, Taisiya. Ion exchange in amorphous alkali-activated aluminosilicates: Potassium based geopolymers. Applied Clay Science, 87 (2014): 205-211.

4. Taisiya Skorina and Irina Tikhomirova. Alkali silicate binders: effect of SiO_2/Na_2O ratio and alkali metal ion type on the structure and mechanical properties. Journal of Materials Science 47, No 12 (2012)

5. Irina Tikhomirova and **Taisiya Skorina,** RU 2386600 patent RF Polymer-concrete composite materials for decoration and construction, 2010 [in Russian]

6. Skorina, Taisiya Functional materials from local and earth-abundant precursors: Scalable and cost-efficient synthetic approach. ***Resource-Efficient Technologies*** 1.1 (2015): 68-70.