
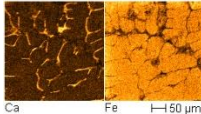
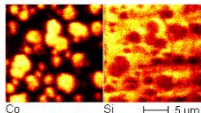
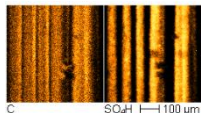




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| <b>name of the unit:</b><br><b>SURFACE ANALYSIS LABORATORY</b><br>Institute of General and Ecological Chemistry, Lodz University of Technology   |   | <b>symbol:</b><br><b>I-31</b><br><a href="https://ichoie.p.lodz.pl">https://ichoie.p.lodz.pl</a>  |
| <b>head of the unit:</b><br>Prof. Małgorzata Iwona Szynkowska-Jóźwik<br>PhD, DSc.  | <b>potential promoters:</b><br>Prof. Małgorzata Iwona Szynkowska-Jóźwik, PhD. DSc.<br>Jacek Rogowski, PhD. DSc. TUL Prof. | <b>contact person:</b><br>Jacek Rogowski,<br>PhD. DSc. TUL Prof.<br>phone: 48-42-631-30-99<br><a href="mailto:jacek.rogowski@p.lodz.pl">jacek.rogowski@p.lodz.pl</a>  |
| <b>scope of activities:</b><br>The main fields of scientific interest are: <ul style="list-style-type: none"><li>• investigation of thermally induced processes occurring in the boundary region of solid phases,</li><li>• studies on the structure and surface composition of supported catalysts,</li><li>• analysis of the changes in the structure and chemical composition of solid surfaces subjected to corrosion or friction,</li><li>• the use of secondary ion mass spectrometry (TOF-SIMS) in forensic studies,</li><li>• TOF-SIMS analysis of hybrid pigments,</li><li>• application of temperature programmed secondary ion mass spectrometry (TP TOF-SIMS) in the studies of diffusion processes on the surfaces of metals and catalysts.</li></ul>   |   | <b>graphic material</b><br><br><br><br><br> |
| <b>present activities:</b><br>The large part activities of Laboratory of Surface Analysis are currently concerned with the application of secondary ion mass spectrometry in the area of investigation of the structure and chemical composition of solid state surfaces.<br>The detailed list of research activities comprises: <ul style="list-style-type: none"><li>• application of TOF-SIMS technique in the analysis of fingerprints, documents and chemical composition of the mixtures of psychoactive substances,</li><li>• TOF-SIMS investigation of the effect of the catalyst preparation method on the chemical and phase composition of the catalyst surface,</li><li>• examination of the effect of the catalyzed reaction on the chemical composition and structure of the catalysts,</li><li>• studies of the changes of the structure and chemical composition of solid surfaces subjected to friction,</li><li>• TOF-SIMS studies of organic-inorganic hybrid pigments.</li></ul> |   |   |
| <b>Future activities:</b><br>Application of TOF-SIMS technique in the study of surfaces and thin layer structures relevant to the development of modern organic semiconductor devices and sensors.<br>Development of the methods for analysis of TOF-SIMS results with the use of chemometrics.  |   |   |
| <b>Keywords:</b><br>TOF-SIMS, catalyst, forensics, fingerprints, surface.  |   |   |



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**Publications/patents, awards, projects:**

- O. Shtyka, V. Shatsila, R. Ciesielski, A. Kedziora, W. Maniukiewicz, S. Dubkov, D. Gromov, A. Tarasov, J. Rogowski, A. Stadnichenko, P. Lazarenko, R. Ryazanov, M. I. Szyrkowska-Jóźwik, T. Maniecki, Adsorption and Photocatalytic Reduction of Carbon Dioxide on TiO<sub>2</sub>, *Catalysts* 11 (2021) 47.
- P. Mierczynski, M. Mosinska, N. Stepinska, K. Chalupka, M. Nowosielska, W. Maniukiewicz, J. Rogowski, N. Goswami, K. Vasilev, M. I. Szyrkowska. Effect of the support composition on catalytic and physicochemical properties of Ni catalysts in oxy-steam reforming of methane, *Catal. Today* 364 (2021) 46–60.
- M. I. Szyrkowska-Jóźwik, Elżbieta Maćkiewicz, Jacek Rogowski, M. Gajek, A. Pawlaczyk, M. de Puit, A. Parczewski, Visualisation of Amphetamine Contamination in Fingerprints Using TOF-SIMS Technique, *Materials* 14 (2021) 6243.
- B. Szadkowski, J. Rogowski, W. Maniukiewicz, E. Beyou, A. Marzec, New natural organic–inorganic pH indicators: Synthesis and characterization of pro-ecological hybrid pigments based on anthraquinone dyes and mineral supports, *J. Ind. Eng. Chem.* 105 (2022) 446-462.
- W. Arabczyk, J. Rogowski, R. Pełka, Z. Lendzion-Bieluń, Application of TOF-SIMS Method in the Study of Wetting the Iron (111) Surface with Promoter Oxides, *Molecules* 27, 2022, 648.

**List of internship proposal in this research team:**

Analysis of the surface of solids subjected to various modifications.  
TOF-SIMS applications in forensic investigations.