# Information on the activities of the Scientific-Research Institute / Center (2017-2021)

**Activities carried out in the direction of sustainable development and socio-economic progress of the country**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| On World Science Day, Shota Rustaveli Georgian National Science Foundation organized the online Conference "From Scientific Idea to Industrialization: The Trajectory of Applied Research Development in the Landscape of Georgia's National Innovative Ecosystem". within the framework of which was conducted the presentation of results of the CARYS-19-442 project with topic - "Bactericidal zeolitic fillers for paper production". Speaker, Project manager, Candidate of Chemical Sciences, senior scientific [illegible] | November 10, 2021 | https://rustaveli.org.ge/geo/siakhleebi/onlain-konferentsia-sametsniero-ideidan-[illegible] |
| Head of Oil Chemistry Laboratory-N. Khetsuriani participated in the online video training on the topic: "Gender Sensitization in Greening the National [illegible] | December, 3-4, [illegible] | https://www.eu4environment.org/ka/events/gender-sensitization-in-greening-the-national-industry-training-workshop-[illegible] |
| [illegible] | [illegible] | [illegible] |

**Activities for the science popularization**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| [illegible] framework of the "Science is the Captain" project, the winner of the "European Researchers' Night" call of the EU Horizon 2020 program "Marie Sklodowskaia-Curie" by the support of Ministry of Education, Science, Culture and Sport of Georgia were prepared videos about working young and honored scientists and the activities of the Petre Melikishvili Institute of Physical and Organic Chemistry at Ivane Javakhishvili Tbilisi [illegible] | 2020 | https://www.tsu.ge/ka/tsu-online/page/%E1%83%9B%E1%83%94%E1%83%AA%E1%83%9C%E1%83%98%E1%83%94%E1%83%A0%E1%83%94%E1%83%91%E1%83%90-%E1%83%99%E1%83%90%E1%83%9E%E1%83%98%E1%83%A2%E1%83%90%E1%83%9C%E1%83%98%E1%83%90[illegible] |
| Presentation of products obtained as a result of the biodiesel production - Natela Khetsuriani and others at the WASTE EXPO 2019 exhibition. Expo [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] |

**Internationalization of research**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| [illegible] Laboratory of the Institute (led by Candidate of Chemical Sciences Natela Khetsuriani) with the National Institute of Standards and Technology of the United States of America, in particular with Prof. Anzor I. Mikaia and Prof. Carlos Gonzales, started with the study of high-molecular aromatic hydrocarbons of Norio oil by chromato-mass spectrometric methods. To obtain a concentrate of aromatic compounds from crude oil, a multi-step separation method was used, which included: Atmospheric and vacuum distillation, extracting the aromatic concentrate from the vacuum fraction with aniline, dividing it into eight parts by vacuum distillation on a rectification column, then separating the distillates on a silica gel chromatographic column - elution with petroleum ether under nitrogen pressure, and the residual organics extracted with hot benzene and crystallization/recrystallization. As a result, up to 900 petroleum eluates, 78 benzene extracts, and 90 crystalline compounds [illegible] | 2017 - 2022 | http://science.org.ge/bnas/t11-n1/08_Khetsuriani.pdf ; https://doi.org/10.13140/RG.2.2.25242.29127 ; https://doi.org/10.31435/rsglobal_ws/30092018/6132 ; https://doi.org/10.13140/RG.2.2.25242.29127 ; https://ibn.idsi.md/ro/vizualizare_articol/87372 ; https://doi.org/10.31435/rsglobal_ws/30062021/7612 ; https://www.researchgate.net/publication/365775611_HIGH_MOLECULAR_HETEROCYCLIC_AROMATIC_HYDROCARBONS |
| The cooperation of the catalysis group (Doctor of Chemical Sciences Tsiuri Ramishvili, consultant Member of Georgian National Academy of Sciences V. Tsitsishvili) of the institute's physical-chemical processes research laboratory with the M. Lomonosov Moscow State University, in particular with Prof. Irina Ivanova and Docent Irina Dobryakova, concerned the study of catalytic transformations of terpene tertiary alcohols, namely linalool and geraniol. Geraniol (3,7-dimethyl-trans-2,6-octadiene-1-ol) and its cis-isomer nerol are valuable aromatic substances having subtle perfume of rose aroma and used in [illegible] | [illegible] | http://science.org.ge/bnas/t11-n3/10_Tsitsishvili.pdf ; http://dx.doi.org/10.24327/ijrsr.2018.0903.1861 ; http://science.org.ge/bnas/t12-n3/10_Tsitsishvili.pdf ; https://doi.org/10.13140/RG.2.2.23249.99684 ; https://doi.org/10.14233/ajchem.2019.21670 ; http://science.org.ge/bnas/t13-n3/09_Ramishvili.pdf ; [illegible] |
| [illegible] | [illegible] | [illegible] |

**Educational activities**

| Involvement in master's or doctoral programs | Period | Program Accreditation Period | Course Development |
|---|---|---|---|
| [illegible] memorandum of cooperation between The Teaching-Research Scientific Center and the Petre Melikishvili Institute of Physical and Organic Chemistry at Iv. Javakhishvili Tbilisi State University in March and May of the academic year PhD students: Natalia Frangishvili, Melano Abesadze and Zurab Chubinishvili, under the guidance of PhD. Giorgi Tsintskaladze and by practical teaching of Tinatin Sharashenidze, research was conducted in the direction of infrared [illegible] | | | |
| Under the supervision of Natela Khetsuriani, a doctoral dissertation was completed on the topic: "Biodiesel production technologies". PhD student: Kakha [illegible] | [illegible] | | |
| [illegible] | [illegible] | [illegible] | |

**"The Third Impact"**

| Response to the challenges facing the country | Implementation period | Reference website or document |
|---|---|---|
| [illegible] program of the Ministry of Environmental Protection and Agriculture of Georgia "Measurements against Asian bedbug Halyomorpha halys" with the National Food Agency was signed labor contract, aimed elaboration and field testing of composite preparation with insectoacaricidal properties against invasive pest invaded in western Georgia. For field trials, the centers of the spread of the pandemic in the Senaki municipality were selected: corn fields in the estates of [illegible] | From August 1 to November 30, 2018 | Annex 3 |

**Scientific and publishing activities**

Organizing international conferences

| Event title | Dates | Number of participating countries | Number of participants |
|---|---|---|---|
| | | | |

Organizing local conferences

| Event title | Dates | Number of participants |
|---|---|---|
| The 90th anniversary of the birth of Academician Teimuraz Andronikashvili was celebrated in the Georgian National Academy of Sciences. | September 25, 2018 | |

Publishing activities

| Title | Language | Electronic ISSN | Print ISSN | The digital object identifier (DOI) (if any) | Resume | Scientific fields and directions |
|---|---|---|---|---|---|---|
| Givi Papava, Ia Chitrekashvili, Ketevan Archvadze. Aromatic polyesters based on the norbornane type bisphenols. LAP LAMBERT Academic Publishing, 2022 | English | ISBN-10: 6204981994 | ISBN: 978-620-4-98199-4 | https://www.lap-publishing.com/catalog/details//store/gb/book/978-620-4-98199-4/aromatic-polyesters-based-on-the-norbornane-type-bisphenols | At the turn of the last and new centuries, the development of cutting-edge equipment greatly increased the requirements for new materials that would have the ability to work in extreme conditions. This gave a powerful impetus to the development of polymer chemistry, especially research in the field of polycondensation. Among high-temperature and heat-resistant polymers, complex aromatic polyesters of the card type are of particular interest, in particular polyarylates, which contain side cyclic substituents in a repeating ring of polymers, one of the atoms of which is simultaneously included both in the substitution and in the main polymer chain. The presence of such groups gives polymers specific properties. They are simultaneously characterized by both good solubility in organic solvents and high thermal parameters, which allows them to be processed from solutions. For the successful synthesis of card-type polymers, it was necessary to study the mechanism and patterns of their formation, which was successfully implemented in this work and the results of the study are fully presented in the monograph. | Chemistry; Chemistry of high molecular compounds |
| Givi Papava, Marina Gurgenishvili, Koba Amirkhanashvili. Card Type Aromatic Polyesters. LAP LAMBERT Academic [illegible] | [illegible] | ISBN-10: 62002313[illegible] | ISBN: 978-620-0-23135-2 | https://www.lap-publishing.com/catalog/details/store/gb/book/978-620-0-23135-2/card-type-aromatic-[illegible] | The presented monography deals with the very interesting class of polymers – aromatic polyesters. Polymers of this class are characterized by especially high heat- and thermal- stability. Often the melting points of these polymers are higher than their destruction points and makes their thermal processing into different items difficult. Their processing from the solutions of the polymers is mostly limited due to their limited solubility in the solvents. Therefore, the polymers that are simultaneously characterized by good solubility and high thermal stability have special practical importance in different fields of technologies. Such polymers are card type polymers in the macromolecules of which a carbon atom simultaneously belongs both to the main [illegible] | Chemistry; chemistry of high molecular [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

**Promoting young researchers (under the age of 40)** — Quantity by years

| 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| | | | | |

**Expertise and / or analytical services**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| The Head of Laboratory of Petroleum Chemistry – Natela Khetsuriani participated in the investigative and procedural actions in the criminal case (inspection of the confiscated reservoirs, determination of possible losses, sample taking) study- examination of gasoline quality. The relevant conclusions and protocols have been forwarded by the TSU administration to the investigative service of the Ministry of Finance of Georgia. | [illegible] | Request of the Investigative Service of the Ministry of Finance of Georgia (letter #N 11038 / 15-04-03/4 17.09.2020) |
| Chemical-mineralogical study and expert report of lime mortar taken from the roof of Gelati temple by the order of the Ministry of Culture and Sports of Georgia and LEPL Levan Samkharauli [illegible] | 2021 | Annex 4 |
| [illegible] | [illegible] | [illegible] |

**Incentives for employs**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| [illegible] announced by the National Academy of Sciences of Georgia to win the academic prize for outstanding scientists, the prize named after academician Giorgi Tsitsishvili in the field of chemistry, submitted by the recommendation of the scientific council of the institute was won by the authors: Doctors of Chemical Sciences - Vladimir Tsitsishvili and Nanuli Dolaberidze, candidates of chemical sciences [illegible] | 2018 | |
| [illegible] institute employees Mzia Tsitsagi, Imeda Rubashvili, Mariam Chkhaidze, Vladimir Tsitsishvili and Ketevan Ebralidze were awarded the Rafiel Agladze Prize of the National Academy of Sciences of Georgia for the series of papers "Innovative Technologies of [illegible] | [illegible] | http://science.org.ge/?p=10045&fbclid=IwAR1qjIpuAST7NnaeetldTcncydxvSr7ICeiaQrPadOWLz5meqLlL_k7Be[illegible] |

**Commercialization, technology transfer**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| [illegible] and chemical characteristics of biodiesel and petroleum diesel were studied. Different mixtures of biodiesel and petroleum diesel fuel were produced. An optimal mixture of biodiesel and petroleum diesel was selected, which ensures the development of diesel fuel technology and its use in internal combustion [illegible] | 2018 | www.biodiesel.ge |

**Auxiliary economic activity**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| | | |

**Promotion of women in science** — Quantity by years

| 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| | | | | |

**Novelty in Management**

| Activity description (up to 350 words) | Implementation period | Reference website or document |
|---|---|---|
| | | |

**Total number of publications**

| 2017 National | 2017 International | 2018 National | 2018 International | 2019 National | 2019 International | 2020 National | 2020 International | 2021 National | 2021 International |
|---|---|---|---|---|---|---|---|---|---|
| 41 | 40 | 35 | 49 | 37 | 44 | 27 | 41 | 34 | 58 |

**Total number of patents**

| 2017 National | 2017 International | 2018 National | 2018 International | 2019 National | 2019 International | 2020 National | 2020 International | 2021 National | 2021 International |
|---|---|---|---|---|---|---|---|---|---|
| 5 | | 4 | | | | 5 | | 3 | |

| | | |
|---|---|---|
| for Innovation and High Technologies at the National Academy of Sciences of Georgia, by Giorgi Tsintskaladze, chief scientist of the Petre Melikishvili Institute of Physical and Organic Chemistry was reported topic: "Prospects of using some natural minerals of Georgia as additives for construction materials". It was noted that an innovative method of modifying the structure of construction materials is to include highly active additives in their composition, and a large selection of natural mineral raw materials in Georgia allows us to obtain such nano additives with different structure and composition. The meeting adopted recommendations that will | November 16, 2018 | http://science.org.ge/?p=2417 |

| | | |
|---|---|---|
| Preparation of project-expenditure documentation for the rehabilitation of the building of the historical museum located at Chanturia St. # 1, in Ozurgeti ordered by Ozurgeti Municipality | 2017 | Annex 10 |
| Preparation of laboratory studies for the restoration of graves in the Mtatsminda Pantheon of Writers and Public Figures by the order of Tbilisi City Hall | 2017 | Annex 5 |
| Preparation of project-expenditure documentation for the structural strengthening of the building (former V. Chabukiani Ballet School) located at 49 Chubinishvili St. in Tbilisi and the rehabilitation of the main facade ordered by LMC LTD | 2017 | Annex 9 |