

PLAN ZARZĄDZANIA DANYMI

1. Opis danych oraz pozyskiwanie lub ponowne wykorzystanie dostępnych danych**1.1. Sposób pozyskiwania i opracowywania nowych danych i/lub ponownego wykorzystania dostępnych danych**

Within the scope of the project multiple types of qualitative and quantitative data will be generated. It will be related to physico-chemical, mechanical and electrochemical measurements. This includes, among otherS UV-VIS/SEM/DSC/TGA/CV/DPV.

Raw data will be analyzed and expressed as graphs, tables and annotated images, some of which are expected to be published. Raw data will be stored in an organized manner by all research team members and sufficient care will be taken to prevent any data loss. In essence, all data processed in this project will be generated by the research activities of the team members within the scope of activities planned and described in the research plan. All data acquisition will be conducted using laboratory instruments with the recommended software. Data will be exported in formats that allow further processing, along with native files accessible via specific software to **ensure data integrity verification**.

1.2. Pozyskiwane lub opracowywane dane (np. rodzaj, format, ilość)

Data generated will be in various formats and sizes of databases, most of which will be accessible using common software allowing easy access and long-term validity during and after the project, thus facilitating data sharing. The data will include, among others, UV-Vis/IR spectra, electrochemical measurement data, and digital images. All data will be stored in both native formats and easily accessible formats such as TIFF, XLS, CSV, TXT, and similar. While the exact volume cannot be estimated at this stage, total storage requirements will not exceed 1TB.

2. Dokumentacja i jakość danych**2.1. Metadane i dokumenty (np. metodologia lub pozyskiwanie danych oraz sposób porządkowania danych) towarzyszące danym**

Data will be collected in a highly automated manner by the equipment which will include additional metadata. Data files will be labeled appropriately and placed in clearly labeled folders. Gdańsk Tech operates a dedicated system, MOST Wiedzy Open Research Data Catalogue which is a platform that allows collecting, searching, analyzing and sharing open research data. These data will be made available free of charge to the scientific community, entrepreneurs and the public. The available research data will be described by standards developed by dedicated, experienced scientific teams. The metadata will allow other external computer systems to interpret the collected data. ORD descriptions will also include data reuse or reduction scenarios to facilitate further processing. Selected data generated within the project will be disseminated with appropriate metadata standards. Metadata description will be stored in JSON-LD format. Contributor will be identified and authorized by ORCID.

2.2. Stosowane środki kontroli jakości danych

Standard protocols will be optimized and used to collect data to ensure reliability and consistency. All experiments will incorporate appropriate positive and negative controls to ensure validity. Whenever possible experimental setups involving internal controls will be preferred. Project staff is trained in techniques they use to ensure quality data. Data will be cataloged in a way to fulfill FAIR standards requirements.

3. Przechowywanie i tworzenie kopii zapasowych podczas badań**3.1. Przechowywanie i tworzenie kopii zapasowych danych i metadanych podczas badań**

All the data will be obtained in laboratory conditions, without risk of their loss. All experimental details and data will be recorded, dated in laboratory notebooks when possible. Data will be kept at secured hard drives and/or GUT and on-line clouds of all members of the research team. Selected data sets will be stored in a dedicated repository, MOST Wiedzy Open Research Data Catalogue (described in detail in 2.1), which also serves as a form of reliable backup, including the metadata. The Principal Investigator will be responsible for the enforcement of the data management plan.

3.2. Sposób zapewnienia bezpieczeństwa danych oraz ochrony danych wrażliwych podczas badań

No medical, personal or otherwise sensitive data is expected to be generated during the proposed project. Data recovery will be possible thanks to backup procedures. Data storage will be kept in accordance with the policy of the Gdańsk Tech, preventing access without the authorization.

4. Wymogi prawne, kodeks postępowania

4.1. Sposób zapewnienia zgodności z przepisami dotyczącymi danych osobowych i bezpieczeństwa danych w przypadku przetwarzania danych osobowych

Intellectual property for any results generated within the project are regulated by the suitable local rules approved at the Gdańsk Tech. Any background IPR will be respected. Any rights belonging to the authors will be shared according to their fair contribution within the scope of the project or on equal rights whenever possible. Whenever possible, dissemination of the deliverables of the project will be carried out using open-access channels, e.g. under Creative Commons licenses.

4.2. Sposób zarządzania innymi kwestiami prawnymi, np. prawami własności intelektualnej lub własnością. Obowiązujące przepisy

The ownership and management of any intellectual property relating to the Project remain in the rights of the Gdansk University of Technology and the research team members accordingly to the Polish law and institutional regulations (Resolution of the Senate of the Gdańsk University of Technology No. 117/2021/XXV of 19 May 2021 https://link.pg.edu.pl/GdańskTech_intprop).

5. Udostępnianie i długotrwałe przechowywanie danych

5.1. Sposób i termin udostępnienia danych. Ewentualne ograniczenia w udostępnianiu danych lub przyczyny embarga

Selected data will be uploaded as soon as possible (not later than after acceptance of the manuscript for publication) and kept at open repository MOST Wiedzy Open Research Data Catalog. There are no restrictions regarding data sharing and no sensitive data will be published. Majority of scientific journals do not require the direct sharing of raw data. However, selected datasets published in a processed way in scientific journals, will be preserved according to the rules imposed by the specific journal (e.g. for 2 or 5 years).

5.2. Sposób wyboru danych przeznaczonych do przechowania oraz miejsce długotrwałego przechowywania danych (np. repozytorium lub archiwum danych)

The data will be stored in a dedicated MOST Wiedzy Open Research Data Catalogue (described in detail in 2.1) repository, free of charge. There are no regulations regarding data destruction. Data provided in the repository will fulfill FAIR requirements (Findable, Accessible, Interoperable, Re-usable), and will be categorized and labeled according to standard file formats. Data carried out under flawed measurement conditions will not be preserved.

5.3. Metody lub narzędzia programowe umożliwiające dostęp do danych i korzystanie z danych

Most of the data will be produced in standard ASCII formats and will require no further transformation. Data will be stored using the dedicated repository MOST Wiedzy Open Research Data Catalogue.

5.4. Sposób zapewniający stosowanie unikalnego i trwałego identyfikatora (np. cyfrowego identyfikatora obiektu (DOI)) dla każdego zestawu danych

The MOST Wiedzy Open Research Data Catalogue repository (described in detail in 2.1) supports obtaining unique DOI numbers for each of the uploaded datasets. Data stored within this project will be linked with such unique DOI numbers.

6. Zadania związane z zarządzaniem danymi oraz zasoby

6.1. Osoba (np. funkcja, stanowisko i instytucja) odpowiedzialna za zarządzanie danymi (np. data steward)

Open Science Competence Centre which is a constituent part of the Gdańsk Tech will be responsible for data management for this Project. Project PI (dr. Swebocki) will be responsible for the procedures of assessment and overall data quality.

6.2. Środki (np. finansowe i czasowe) przeznaczone do zarządzania danymi i zapewnienia możliwości odnalezienia, dostępu, interoperacyjności i ponownego wykorzystania danych

No specific allocation within the project for FAIR enforcement is planned. This is because the Gdańsk Tech already operates a platform, the MOST Wiedzy Open Research Data Catalog (described in detail in 2.1) already implements these requirements. As the platform is available free to the employees of the Gdańsk Tech, it will be utilized at no additional cost. Special care will be taken to ensure that all data that is to be disseminated via this platform is checked for integrity and errors. This process will be the responsibility of each of the researchers. In general, an average of 10% of the time within the project will be dedicated to preparation of data summaries, presentations and data integrity checks.