

## ACT LAUNCH Project No 299662



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**L**owering **A**bsorption process **U**ncertainty, risks and **C**osts by predicting and controlling amine degradation

## Technical Memorandum, Solvent Degradation database

(related to the data base application)

Dissemination level	Public	
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## Executive summary

A public database for amine degradation data was established during the LAUNCH project. This is a unique platform for sharing and searching for data related to the stability and degradation of amine solvents for CO<sub>2</sub> capture and facilitates knowledge sharing and application of real data in models and simulations of the CO<sub>2</sub> capture process. Data from a range of lab and pilot scale degradation tests are made available and searchable in this database, which is currently administered by SINTEF Industry. The database currently contains 45 different datasets, which are all connected to published literature. In the database, a collection of data, metadata and additional information about setups and experiments can be found and shared. This memo introduces how the database works and how it can be used.



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## 1 Introduction

As part of the LAUNCH project a solvent degradation database is established. In this database the main focus is analytical results of degradation compounds in solvents during bench scale solvent degradation, pilot testing, etc. The first version of the database was based on available literature data, incorporating data from lab to pilot scale, and was later extended with data generated in the project. During the project the access to the database was limited to the project partners, but now as the project is ended the database is made publicly available. This MEMO gives a short description of the database, how to access it as well as how to add new data.





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Issue date  
Dissemination Level  
Page

LAUNCH D1.1.2 Degradation Database User  
Guidelines.docx  
07.04.2023  
Public  
7/12

### 3 Accessing the database

Go to the Database which is located here: <https://launchdb.sintef.no>

LAUNCH

Add Data Search User Guide Support Sign Up Log In

#### Welcome to the LAUNCH degradation database

The solvent degradation database contains available data from literature, incorporating data from laboratory to pilot scale. The database will be extended throughout the LAUNCH project with data generated in lab scale and by operating the LAUNCH degradation rigs, pilots and commercial plants.

In this first version of the database, data will be added by participants of LAUNCH project Task 1.1 in WP1. All work packages of the project will have access to the data.

[Click here to enter the database](#)

#### Acknowledgement

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Project homepage: [www.launchccus.eu](http://www.launchccus.eu)

SINTEF

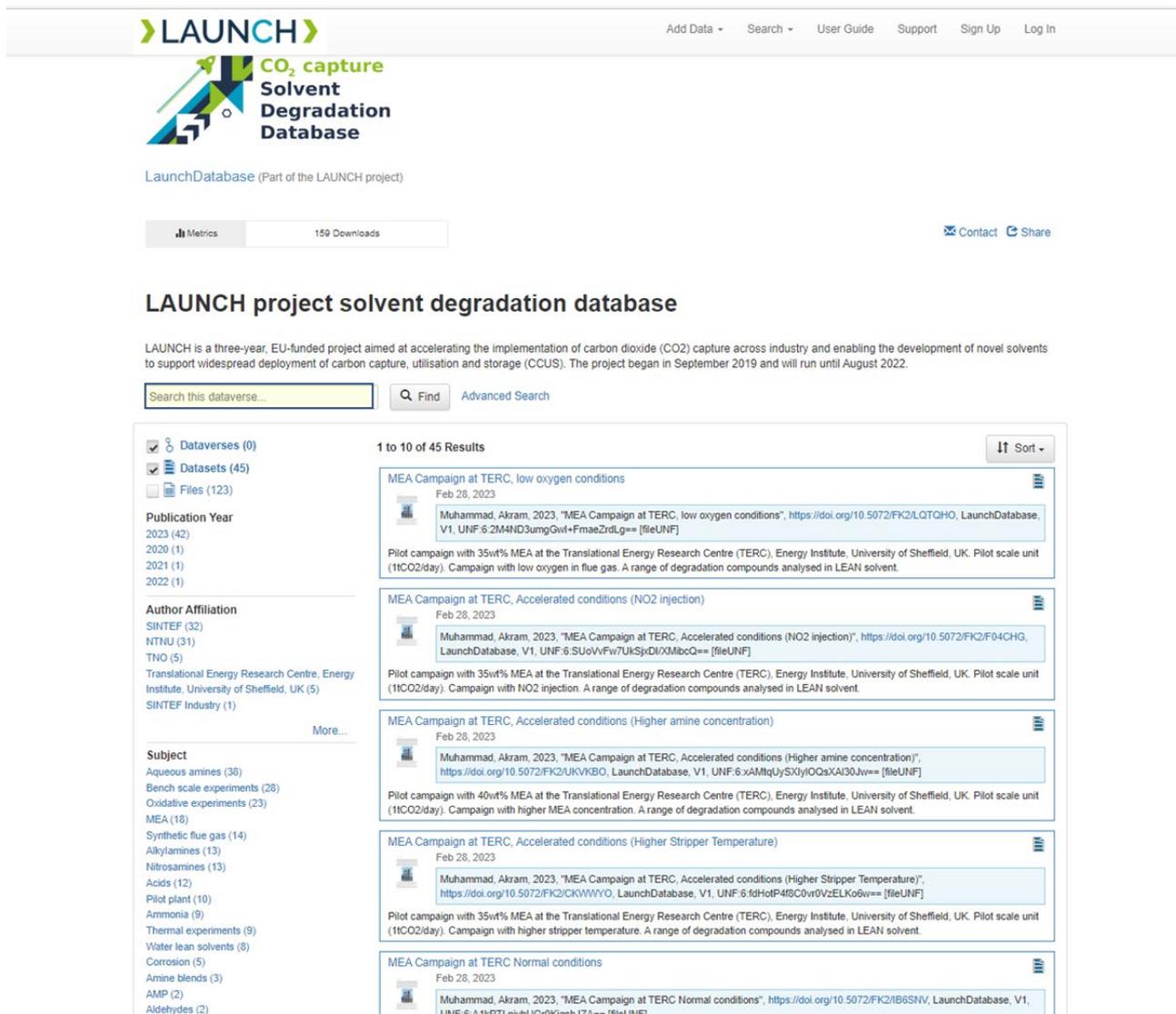
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Powered by The Dataverse Project v. 4.19 build 331-affb4f

Figure 3.1 LAUNCH database, welcome page.

From the welcome page you click on the button marked *Click here to enter the database* to enter the database.

In the database there is a search field, which can be seen marked with yellow in *Figure 3.2*. Here it is possible to search for instance on chemical name (or abbreviation) or CAS number. It is also possible to click on the Subject and Author Affiliation and list with matching entries will appear in a new window. In the bottom you can scroll through all entries in the database. On the top there is also a User Guide if help or more info on the Dataverse is needed.



**LAUNCH project solvent degradation database**

LAUNCH is a three-year, EU-funded project aimed at accelerating the implementation of carbon dioxide (CO<sub>2</sub>) capture across industry and enabling the development of novel solvents to support widespread deployment of carbon capture, utilisation and storage (CCUS). The project began in September 2019 and will run until August 2022.

Search this dataverse...   [Advanced Search](#)

**1 to 10 of 45 Results** Sort -

- MEA Campaign at TERC, low oxygen conditions**  
Feb 28, 2023  
Muhammad, Akram, 2023, "MEA Campaign at TERC, low oxygen conditions", <https://doi.org/10.5072/FK2/LQTQHO>, LaunchDatabase, V1, UNF:6:2M4ND3umgGwi+FmaeZrdLg== [fileUNF]  
Pilot campaign with 35wt% MEA at the Translational Energy Research Centre (TERC), Energy Institute, University of Sheffield, UK. Pilot scale unit (1tCO<sub>2</sub>/day). Campaign with low oxygen in flue gas. A range of degradation compounds analysed in LEAN solvent.
- MEA Campaign at TERC, Accelerated conditions (NO<sub>2</sub> injection)**  
Feb 28, 2023  
Muhammad, Akram, 2023, "MEA Campaign at TERC, Accelerated conditions (NO<sub>2</sub> injection)", <https://doi.org/10.5072/FK2/F04CHG>, LaunchDatabase, V1, UNF:6:SUoVvFw7UkSjxDlXIMbcQ== [fileUNF]  
Pilot campaign with 35wt% MEA at the Translational Energy Research Centre (TERC), Energy Institute, University of Sheffield, UK. Pilot scale unit (1tCO<sub>2</sub>/day). Campaign with NO<sub>2</sub> injection. A range of degradation compounds analysed in LEAN solvent.
- MEA Campaign at TERC, Accelerated conditions (Higher amine concentration)**  
Feb 28, 2023  
Muhammad, Akram, 2023, "MEA Campaign at TERC, Accelerated conditions (Higher amine concentration)", <https://doi.org/10.5072/FK2/JUKVKB0>, LaunchDatabase, V1, UNF:6:xAMtqUySXiyOOsXAI30Jv== [fileUNF]  
Pilot campaign with 40wt% MEA at the Translational Energy Research Centre (TERC), Energy Institute, University of Sheffield, UK. Pilot scale unit (1tCO<sub>2</sub>/day). Campaign with higher MEA concentration. A range of degradation compounds analysed in LEAN solvent.
- MEA Campaign at TERC, Accelerated conditions (Higher Stripper Temperature)**  
Feb 28, 2023  
Muhammad, Akram, 2023, "MEA Campaign at TERC, Accelerated conditions (Higher Stripper Temperature)", <https://doi.org/10.5072/FK2/CKWVWYO>, LaunchDatabase, V1, UNF:6:fdHotP48C0vr0VzELK06v== [fileUNF]  
Pilot campaign with 35wt% MEA at the Translational Energy Research Centre (TERC), Energy Institute, University of Sheffield, UK. Pilot scale unit (1tCO<sub>2</sub>/day). Campaign with higher stripper temperature. A range of degradation compounds analysed in LEAN solvent.
- MEA Campaign at TERC Normal conditions**  
Feb 28, 2023  
Muhammad, Akram, 2023, "MEA Campaign at TERC Normal conditions", <https://doi.org/10.5072/FK2/IB6SNV>, LaunchDatabase, V1, UNF:6:AtkPPTLnvbUGr0KoshJZA== [fileUNF]

Figure 3.2 LAUNCH degradation database, Overview Window

To see the contents of an entry, just click on the name/title and that entries opens in a new window, as illustrated below (Figure 3.3). Here the entered metadata appears as well as all files that are available for this entry. In this case there were 7 files, which is also available to download. For this example, the XY data with the analytical results is in the file *RAW data SDR MEA 2016.tab*. There is also a supporting file with compounds name and more details of the analytical methods used (*Overview compounds and liquid analysis.xls*), file with a picture of the apparatus, file with procedure, as well as files with P&ID and Flow Diagram.

**LAUNCH** Add Data - Search - User Guide - Support - Sign Up - Log In

**CO<sub>2</sub> capture Solvent Degradation Database**

LaunchDatabase (Part of the LAUNCH project)

LaunchDatabase > MEA campaign solvent degradation rig 2016 [Contact](#) [Share](#)

### MEA campaign solvent degradation rig 2016

Version 1.0

Vevelstad, Solrun Johanne; Grimsdvedt, Andreas; Haugen, Geir; Einbu, Aslak; Vernstad, Kai; Zahlsen, Kolbjørn, 2021, "MEA campaign solvent degradation rig 2016", <https://doi.org/10.5072/FK2/SUIVKB>, LaunchDatabase, V1, UNF:8:UJk8KtcDdLd1vn+EHnRjw== [fileUNF]

[Cite Dataset -](#) [Learn about Data Citation Standards.](#)

**Dataset Metrics**  
19 Downloads

**Description**  
Study of chemical stability of MEA under different process conditions, system taking into account temperature swing, High NO<sub>x</sub> concentration and high desorber temperature were investigated. Several degradation compounds have been quantified including ammonia, alkylamine, amide, imidazole, piperazinone, nitrosamine, pyrazine, urea and several more. (2016-08-23)

**Subject**  
Aqueous amines; MEA; Synthetic flue gas; Bench scale pilot; HSE; Nitrosamines; Alkylamines; Ammonia

**Keyword**  
Chemical stability, cycled system, MEA, degradation compounds

**Related Publication**  
Results from MEA campaign using SDR rig. A large set of degradation compounds from MEA have been quantified, for example MEA urea. Nitrogen and nitrosamine balance included. [issn: 1876-8102](#)

Files | Metadata | Terms | Versions

Change View:

Search this dataset...

Filter by: File Type: All - Access: All -

1 to 7 of 7 Files

<input type="checkbox"/>	Overview compounds and liquid analysis.xlsx SDR 2016/Raw data SDR MEA 2016/ MS Excel Spreadsheet - 24.1 KB - Apr 7, 2021 - 4 Downloads MDS: d70c154da091a3f11089f56a2427608	<input type="button" value="Download -"/>
<input type="checkbox"/>	Picture of SDR rig.pdf SDR 2016/Pictures/ Adobe PDF - 118.9 KB - Apr 7, 2021 - 1 Download MDS: ac689235c2ac5945172ab7680c2d	<input type="button" value="Download"/>
<input type="checkbox"/>	Procedure SDR.pdf SDR 2016/Procedure and P&ID/ Adobe PDF - 201.4 KB - Apr 7, 2021 - 2 Downloads MDS: 37859c18c1b75b218aa1e918b62746	<input type="button" value="Download"/>
<input type="checkbox"/>	Raw data SDR MEA 2016-1.tab SDR 2016/Raw data SDR MEA 2016/ Tabular Data - 44.5 KB - Apr 7, 2021 - 6 Downloads 259 Variables, 16 Observations - UNF:8:48F03MuPSY4kczvR9hbCA==	<input type="button" value="Download -"/>
<input type="checkbox"/>	Raw data SDR MEA 2016.tab SDR 2016/Raw data SDR MEA 2016/ Tabular Data - 40.1 KB - Apr 7, 2021 - 3 Downloads 259 Variables, 16 Observations - UNF:8:AGC2VtPhaXh6z3gkzA==	<input type="button" value="Download -"/>
<input type="checkbox"/>	Rig piping and instrumentation diagram - P&ID.pdf SDR 2016/Procedure and P&ID/ Adobe PDF - 102.2 KB - Apr 7, 2021 - 1 Download MDS: 0c358233a961035c21cb8303a5819cd9	<input type="button" value="Download"/>
<input type="checkbox"/>	Simplified flow diagram of the SDR.pdf SDR 2016/Pictures/ Adobe PDF - 42.5 KB - Apr 7, 2021 - 2 Downloads MDS: 038cb42f8ac789af34d2c89a0b32d0	<input type="button" value="Download"/>

Figure 3.3 Example of a dataset in the database, with Metadata and files available for download.

## 4 Adding new data to the database

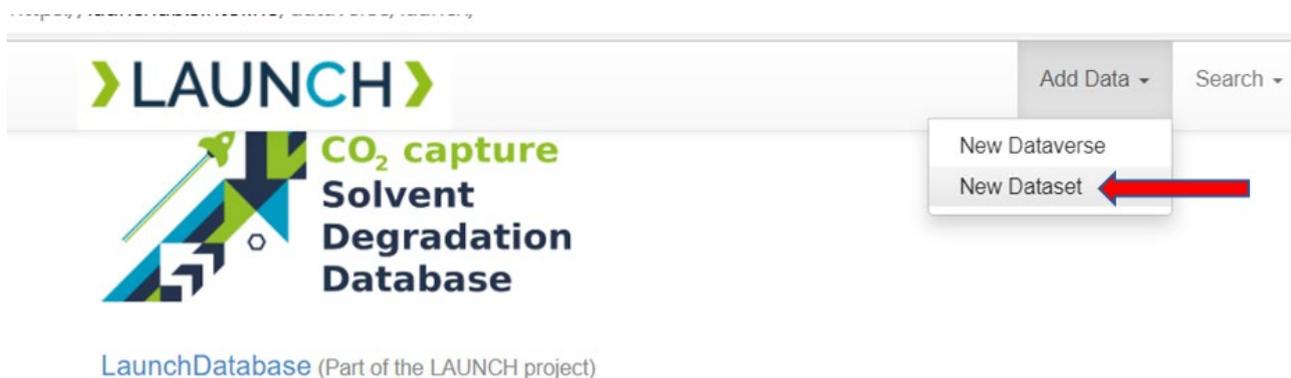
To add new data to the database, you must first create an account which is done by clicking Sign Up (see *Figure 4.1*)



*Figure 4.1 Sign up*

When you sign up, you will be given access to add new data. Please note that this you take some days before the account is ready.

When you have the account, you then need to Log in (Log In is on the upper right side of the page). Then you choose Add Data and New Dataset (as illustrated in *Figure 4.2*)



*Figure 4.2 Adding New Dataset*

You then get a form where you fill in the metadata, and upload the relevant files (see *Figure 4.3*)

LAUNCH Database > New Dataset

Most Definitions

Changing the host database will clear any fields you may have entered data into.

LAUNCH Database

\*Asterisks indicate required fields

Citation Metadata

Title \*

Author \*

Contact \*

Description \*

Subject \*

Keyword

Related Publication

Notes

Depositor

Deposit Date

Files

For more information about supported file formats, please refer to the User Guide.

Upload with HTML5 via your browser

Select files or drag and drop into the upload widget.

Select Files to Add

Drag and drop files here.

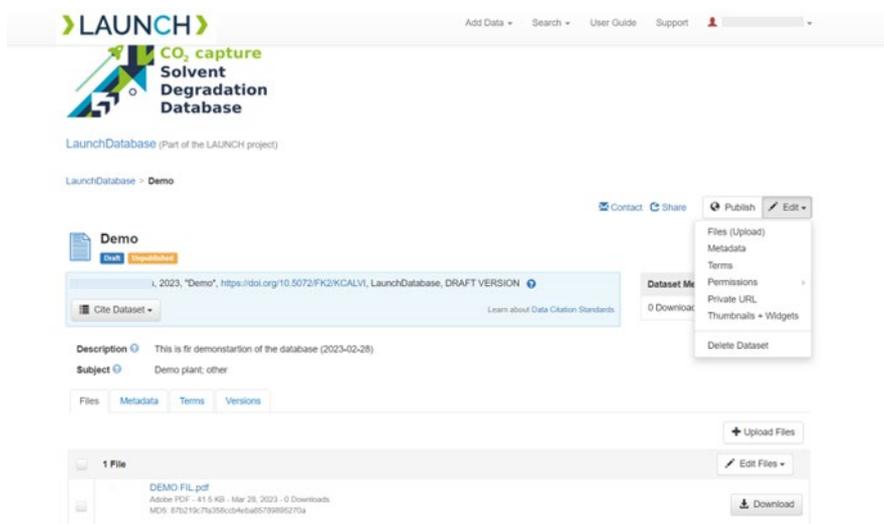
Metadata Tip: After adding the dataset, click the Edit Dataset button to add more metadata.

Save Dataset Cancel

Figure 4.3 Form to enter metadata and upload files.

The analytical data (i.e., chemical analysis) of samples from experiment/pilot campaign must be added as an XY table and it is most convenient to upload an MS-Excel or Tab separated file. All analyzed results and compounds should be uniquely described, i.e., heading should include unit, analysis method and CAS number. It is worth noting that the search bar of the LAUNCH database searches only through the header row of the data tables, which is why descriptive headings facilitate finding the data you need when searching. The first columns should be used for sample id, time or sequence number, values for conditions that were varied. If you have many literature references for your set, this could be listed in a separate file which then also should be uploaded. Further details may be described in separate files which can also be uploaded. It is recommended to look at already published data sets in the database as examples.

When the metadata and files has been entered, remember to save the dataset (button on the left bottom of the page). You can later edit the entry, this you do by choosing the dataset in the database and then select the Edit button (see *Figure 4.4*), where you can edit the metadata. or upload more files etc.



*Figure 4.4 Edit of dataset.*

At this stage the data is not yet published in the database (it is only you who see the dataset), but will at this point be reviewed (currently by SINTEF) before it is published to the database. After you have submitted your dataset for review, you may no longer edit it, until the review process is done. Once the review has been completed and the dataset is approved, it will become searchable, and you may also edit the submission. If you make changes and resubmit the dataset, another review of the data will take place before the changes become publicly available.