

Package: kwb.geosalz (via r-universe)

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Title R Package for Documenting Workflow Used in Project ``geosalz"

Version 0.7.2

Description R Package for Documenting Workflow Used in Project
``geosalz".

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URL <https://github.com/KWB-R/kwb.geosalz>

BugReports <https://github.com/KWB-R/kwb.geosalz/issues>

Depends R (>= 2.10)

Imports archive, cowplot, cellranger (>= 1.1.0), crayon (>= 1.3.4),
curl, data.table (>= 1.12.0), dplyr (>= 0.7.8), forcats, fs (>=
1.2.6), geosalz.phreeqc, ggplot2 (>= 3.1.0), janitor (>=
1.1.1), jsonlite, kwb.base, kwb.file, kwb.nextcloud, kwb.utils,
magrittr (>= 1.5), parallel, readODS, readr (>= 1.4.0), readxl
(>= 1.2.0), RColorBrewer, rlang (>= 0.3.1), rmarkdown (>=
1.11), sf, stringr (>= 1.4.0), tibble (>= 2.0.1), tidyr (>=
0.8.2), tidyselect (>= 1.1.2), withr, zoo

Suggests curl, covr (>= 3.2.1), DT, ggforce, htmltools, htmlwidgets,
knitr (>= 1.21), kwb.pkgbuild, leaflet, openxlsx, phreeqc,
sessioninfo (>= 1.1.1), wasserportal

VignetteBuilder knitr

Remotes github::cran/phreeqc, github::KWB-R/geosalz.phreeqc,
github::KWB-R/kwb.base, github::KWB-R/kwb.nextcloud,
github::KWB-R/kwb.pkgbuild, github::KWB-R/kwb.utils,
github::KWB-R/wasserportal

ByteCompile true

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Repository <https://kwb-r.r-universe.dev>

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<code>add_site_metadata</code>	<i><code>add_site_metadata</code></i>
--------------------------------	---------------------------------------

Description

`add_site_metadata`

Usage

`add_site_metadata(df, site_path)`

Arguments

<code>df</code>	<code>df</code>
<code>site_path</code>	<code>site_path</code>

Value

data frame with added site metadata

<code>all_defined</code>	<i>Check if all strings are not empty</i>
--------------------------	---

Description

Check if all strings are not empty

Usage

`all_defined(x)`

Arguments

<code>x</code>	vector of character
----------------	---------------------

Value

TRUE or FALSE

cat_green_bold_0	Helper function: cat_green_bold_0
------------------	-----------------------------------

Description

Helper function: cat_green_bold_0

Usage

cat_green_bold_0(...)

Arguments

... text passed to crayon::green()

Value

formatted text output

cat_red_bold_0	Helper function: cat_red_bold_0
----------------	---------------------------------

Description

Helper function: cat_red_bold_0

Usage

cat_red_bold_0(...)

Arguments

... text passed to crayon::red

Value

formatted text output

column_pattern_gather_ignore

Helper function: column_pattern_gather_ignore

Description

Helper function: column_pattern_gather_ignore

Usage

```
column_pattern_gather_ignore(
  fields = c("Datum", "KN", "[iI]nterne Nr.", "Name der", "Ort", "Probe", "Prü",
    "Untersuchung", "Labor", "Jahr", "Galer", "Detail", "Meß", "Zeit", "Bezei", "Monat")
)
```

Arguments

fields column names to be ignored for gathering (default: c("Datum", "KN", "[iI]nterne Nr.", "Name der", "Ort", "Probe", "Prü", "Untersuchung", "Labor", "Jahr", "Galer", "Detail", "Me\u00DF", "Zeit", "Bezei", "Monat"))

Value

vector with ignored columns for gathering

column_pattern_gather_ignore_clean

Helper function: column_pattern_gather_ignore_clean

Description

Helper function: column_pattern_gather_ignore_clean

Usage

```
column_pattern_gather_ignore_clean(
  fields = c("LabSampleCode", "Date", "Time", "Waterbody", "ExSiteCode", "Site")
)
```

Arguments

fields column names to be ignored for gathering (default: c("LabSampleCode", "Date", "Time", "Waterbody", "ExSiteCode", "Site"))

Value

vector with ignored columns for gathering

convert_phreeqc_input_to_wide	<i>Convert PhreeqC input to "wide" format</i>
-------------------------------	---

Description

Convert PhreeqC input to "wide" format

Usage

```
convert_phreeqc_input_to_wide(phreeqc_input)
```

Arguments

phreeqc_input PhreeqC input as retrieved by [get_phreeqc_data](#)

Value

PhreeqC input in "wide" format

convert_to_sf	<i>Convert to SF</i>
---------------	----------------------

Description

Convert to SF

Usage

```
convert_to_sf(  
  df,  
  crs_source = 25833,  
  crs_target = 4326,  
  col_coord_x = "Rechtswert_UTM_33_N",  
  col_cood_y = "Hochwert_UTM_33_N"  
)
```

Arguments

df	data frame or tibble with spatial data
crs_source	original CRS (default: 25833)
crs_target	target CRS (default: 4326)
col_coord_x	column name of latitude (default: "Rechtswert_UTM_33_N")
col_cood_y	column name of longitude (default: "Hochwert_UTM_33_N")

Value

data frame or tibble converted to sf

Examples

```
gwl_master <- jsonlite::fromJSON("https://kwb-r.github.io/wasserportal/stations_gwl_master.json")
convert_to_sf(gwl_master)
```

convert_xls_as_xlsx	<i>Convert xls to xlsx</i>
---------------------	----------------------------

Description

Convert xls to xlsx

Usage

```
convert_xls_as_xlsx(  
  input_dir,  
  export_dir = tempdir(),  
  office_folder = safe_office_folder(),  
  dbg = TRUE  
)
```

Arguments

input_dir	input directory containing .xls files
export_dir	export directory (default: tempdir())
office_folder	office folder path (default: safe_office_folder)
dbg	debug (default: TRUE)

convert_xls_to_xlsx	<i>Helper function: convert_xls_to_xlsx</i>
---------------------	---

Description

Helper function: convert_xls_to_xlsx

Usage

```
convert_xls_to_xlsx(exe, xls, xlsx, i, n_files, dbg = TRUE)
```

Arguments

exe	exe
xls	xls
xlsx	xlsx
i	i
n_files	n_files
dbg	debug (default: TRUE)

copy_lookup_para_file	<i>Helper function: copy_lookup_para_file</i>
-----------------------	---

Description

Helper function: copy_lookup_para_file

Usage

```
copy_lookup_para_file(  
  from_dir,  
  to_dir,  
  overwrite = FALSE,  
  recursive = TRUE,  
  file_pattern = "^lookup_para\\.csv$"  
)
```

Arguments

from_dir	input directory with xlsx files
to_dir	target directory where to copy the xlsx files
overwrite	should existing files be overwritten (TRUE) otherwise (FALSE) ? (default: FALSE)
recursive	if TRUE recursively find all xlsx files in the directory specified in parameter "from_dir" (default: TRUE)
file_pattern	pattern for identifying lookup_para file (default: "^lookup_para\\.csv\$")

copy_xlsx_files	<i>Helper function: copy_xlsx_files</i>
-----------------	---

Description

Helper function: copy_xlsx_files

Usage

```
copy_xlsx_files(
  from_dir,
  to_dir,
  overwrite = FALSE,
  recursive = TRUE,
  file_pattern = "[xX][lL][sS][xX]"
)
```

Arguments

from_dir	input directory with xlsx files
to_dir	target directory where to copy the xlsx files
overwrite	should existing files be overwritten (TRUE) otherwise (FALSE) ? (default: FALSE)
recursive	if TRUE recursively find all xlsx files in the directory specified in parameter "from_dir" (default: TRUE)
file_pattern	pattern for identifying xlsx fles (default: "[xX][lL][sS][xX]")

create_emshoff91_import	<i>Create EMSHOFF91 Import Data Frame</i>
-------------------------	---

Description

Create EMSHOFF91 Import Data Frame

Usage

```
create_emshoff91_import(
  ods_dir,
  files_to_ignore = c("cl25", "clliste", "rupelauf", "salzlast")
)
```

Arguments

`ods_dir` directory to ".ods" files created manually by importing original ".wq1" files into LibreOffice 7.0 on Ubuntu with encoding (Western Europe (DOS/OS2-437/US)) and exporting to ".ods" format

`files_to_ignore` tidied names of files to ignore due to complex data input structure not yet covered by importer (default: c("cl25", "clliste", "gwnguede", "rupelauf", "salzlast"))

Value

data frame with columns "ods_paths" (full paths to ".ods" files), "ods_files" (their "basenames") and "ods_names_clean" (tidied names used as identifier)

Examples

```
## Not run:
ods_dir <- "<replace-with-path-to-files>/emshoff91/converted_ods"
emshoff91_import <- create_emshoff91_import(ods_dir)

## End(Not run)
```

```
create_sftp_connection
```

Measurement Chains: Create SFTP credentials (curl backend)

Description

Measurement Chains: Create SFTP credentials (curl backend)

Usage

```
create_sftp_connection()
```

Value

list with server/username/password/port

delete_registry	<i>Helper function: delete_registry</i>
-----------------	---

Description

Helper function: delete_registry

Usage

```
delete_registry(office_folder = safe_office_folder(), dbg = TRUE)
```

Arguments

office_folder	office folder path (default: safe_office_folder)
dbg	debug (default: TRUE)

download_measurementchains_data

Measurement Chains: download data (SFTP via curl)

Description

Measurement Chains: download data (SFTP via curl)

Usage

```
download_measurementchains_data(
  sftp_paths,
  target_directory = temp_dir(),
  run_parallel = TRUE,
  debug = FALSE
)
```

Arguments

sftp_paths	character vector with relative paths to files (under MESSKETTEN_REMOTE_DIR)
target_directory	target directory
run_parallel	default: TRUE (will create separate curl handles; ok)
debug	show debug messages (default: FALSE)

Value

character vector of local file paths

emshoff91_list_to_df *Emshoff 91: list to data frame*

Description

Emshoff 91: list to data frame

Usage

```
emshoff91_list_to_df(emshoff91_list)
```

Arguments

emshoff91_list list as retrieved by [read_multiple_emshoff91_ods](#)

Value

tibble

emshoff91_remap_values

Emshoff 91: remap values from imported tibble

Description

Emshoff 91: remap values from imported tibble

Usage

```
emshoff91_remap_values(
  emshoff91_df,
  remap_list = list(fi_mi = "fi_mi_m_nn", ku_sto = "kupp_st", lf = "el_lf", progr =
    "beprob_progr", strat = "stratigr", uv254 = "uv_ext"),
  delete_cols = TRUE
)
```

Arguments

emshoff91_df	tibble as retrieved by emshoff91_list_to_df
remap_list	list with values to be remapped. Names of the list are columns values contained in list values should be mapped to (default: list(fi_mi = "fi_mi_m_nn", ku_sto = "kupp_st", lf = "el_lf", progr = "beprob_progr", strat = "stratigr", uv254 = "uv_ext"))
delete_cols	should unneeded columns be deleted, i.e. the ones where data where mapped from (default: TRUE)

Value

data frame with remapped values and deleted columns were this values were copied from (default: TRUE)

gather_and_join_1	<i>Helper function: gather_and_join_1</i>
-------------------	---

Description

Helper function: gather_and_join_1

Usage

```
gather_and_join_1(tmp_data, columns_keep, metadata, dbg = FALSE)
```

Arguments

tmp_data	tmp_data
columns_keep	columns_keep
metadata	metadata
dbg	dbg (default: FALSE)

Value

gathered and joined data frame

gather_and_join_2	<i>Helper function: gather_and_join_2</i>
-------------------	---

Description

Helper function: gather_and_join_2

Usage

```
gather_and_join_2(tmp_content, columns_keep, header)
```

Arguments

tmp_content	tmp_content
columns_keep	columns_keep
header	header

Value

gathered and joined data frame

get_excelcnv_exe	<i>Helper function: get_excelcnv_exe</i>
------------------	--

Description

Helper function: get_excelcnv_exe

Usage

```
get_excelcnv_exe(office_folder = safe_office_folder())
```

Arguments

office_folder office folder path (default: safe_office_folder)

Value

path containing 'excelcnv.exe'

get_foerdermengen	<i>get_foerdermengen</i>
-------------------	--------------------------

Description

get_foerdermengen

Usage

```
get_foerdermengen(
  xlsx_path,
  sheet_name = "WW Q Rhow ",
  sheet_range = "A4:S127"
)
```

Arguments

xlsx_path	path to xlsx file with pumping rates
sheet_name	sheet_name (default: "WW Q Rhow ")
sheet_range	sheet_range (default: "A4:S127")

Value

data frame with annual pumping rates per waterworks

`get_foerdermengen_gal_fri`*Get Abtraction of Friedrichshagen Well Galleries*

Description

Get Abtraction of Friedrichshagen Well Galleries

Usage

```
get_foerdermengen_gal_fri(path)
```

Arguments

path	path to "2018-04-27 Rohwasser Bericht - Galeriefördermengen.xlsx"
------	---

Value

tidy data frame with abstraction rates for waterworks Friedrichshagen

`get_measurement_chain_data_on_cloud`*Get Measurement Chain Data on KWB Cloud*

Description

Get Measurement Chain Data on KWB Cloud

Usage

```
get_measurement_chain_data_on_cloud(dbg = TRUE)
```

Arguments

dbg	logical indicating whether or not to show debug messages
-----	--

Value

data frame with the content of "mc_data.zip" in the GeoSalz project folder on the Nextcloud server. The SFTP paths to the files from which the data in "mc_data.zip" originate are returned in attribute "sftp_paths". If either of the files "mc_data.zip" or "mc_files.csv" does not exist, NULL is returned.

`get_measurementchains_files`*Measurement Chains: Get Available Files from SFTP*

Description

Lists all available measurement chain files on the SFTP server and extracts metadata encoded in the file names. The function recursively scans the remote directory, identifies files belonging to measurement chains and returns a tidy table with parsed metadata.

Usage

```
get_measurementchains_files(  
  sftp_connection = create_sftp_connection(),  
  debug = FALSE  
)
```

Arguments

sftp_connection	connection credentials as returned by create_sftp_connection .
debug	logical. If TRUE, prints diagnostic messages about files that do not match the measurement chain naming scheme. Default: FALSE.

Details

Files that do not match the expected measurement chain naming pattern are automatically ignored and reported in an attribute of the returned object.

Expected filename pattern (without extension):

LF_<sensor_id><sensor_endnummer>-YYYY-MM-DD-HHMM

or

<sensor_id><sensor_endnummer>-YYYY-MM-DD-HHMM

The function performs the following steps:

1. Recursively lists all files in the configured SFTP directory
2. Splits paths into folder and filename components
3. Validates filenames against the measurement chain naming scheme
4. Parses sensor metadata and timestamps from filenames
5. Returns a tidy table with extracted metadata

This approach makes the import robust against unrelated files (e.g. Thumbs.db, desktop.ini, or documentation files) that may be present on the server.

Value

A tibble with metadata for all detected measurement chain files. The table includes:

- `sftp_path` – full path of the file on the SFTP server
- `galerie` – gallery identifier derived from folder name
- `brunnen_nummer` – well number derived from folder name
- `prefix` – optional file prefix (e.g. LF_)
- `sensor_id` – numeric sensor identifier
- `sensor_endnummer` – sensor end number
- `datum_uhrzeit` – timestamp parsed from the filename

Additionally the returned object contains an attribute:

- `ignored_files` – tibble listing files that were skipped because their names do not match the expected measurement chain pattern.

Examples

```
## Not run:

# connect and list files
mc_files <- kwb.geosalz::get_measurementchains_files()

# inspect parsed metadata
str(mc_files)

# inspect ignored files
attr(mc_files, "ignored_files")

## End(Not run)
```

```
get_measurementchains_metadata
```

Measurement Chains: Get Metadata

Description

Measurement Chains: Get Metadata

Usage

```
get_measurementchains_metadata(file = extdata_file("metadata_messketten.csv"))
```

Arguments

`file` path to measurement chains metadata file. Default: `kwb.geosalz::extdata_file("metadata_messketten.csv")`

Value

tibble with measurement chains metadata

Examples

```
mc_metadata <- kwb.geosalz::get_measurementchains_metadata()
str(mc_metadata)
mc_metadata
```

get_measurmentchains_data_stats

Measurement Chains: get statistics for data

Description

Measurement Chains: get statistics for data

Usage

```
get_measurmentchains_data_stats(mc_data)
```

Arguments

mc_data tibble with measurement chains data as retrieved by [read_measurementchains_data](#)

Value

tibble with columns datetime min/max, q10 (10 median, q90 (90

get_meta_sheet_or_stop

Helper function: get_meta_sheet_or_stop

Description

Helper function: get_meta_sheet_or_stop

Usage

```
get_meta_sheet_or_stop(sheets, pattern, file)
```

Arguments

sheets	sheets
pattern	pattern
file	file

Value

meta sheet name

get_pandoc_info	<i>Get Information on Pandoc</i>
-----------------	----------------------------------

Description

Get Information on Pandoc

Usage

get_pandoc_info()

Value

data frame with columns pandoc_directory, pandoc_version if Pandoc is installed, otherwise a message is printed that pandoc is not installed.

get_parameters_meta	<i>get_parameters_meta</i>
---------------------	----------------------------

Description

get_parameters_meta

Usage

get_parameters_meta(xlsx_path, sheet_name = "nur Parameterliste")

Arguments

- xlsx_path path to EXCEL spreadsheet with parameter metadata
- sheet_name name of sheet containing metadata table (default: "nur Parameterliste")

Value

imported parameter metadata with cleaned columns names

get_phreeqc_data	<i>Get PhreeqC data</i>
------------------	-------------------------

Description

Get PhreeqC data

Usage

```
get_phreeqc_data(lab_bwb)
```

Arguments

lab_bwb	imported BWB lab data as retrieved by read_lab_bwb
---------	--

Value

tibble with columns solution, par_name_phreeqc (which are not empty or NA) and numeric_value

get_site_id	<i>Helper function: get_site_id</i>
-------------	-------------------------------------

Description

Helper function: get_site_id

Usage

```
get_site_id(string, pattern = "^[0-9]{1,4}")
```

Arguments

string	vector with character strings
pattern	pattern used for identifying site_id (default: "[0-9]1,4")

Value

extracted site_id's from input string

import_labor	<i>import_labor</i>
--------------	---------------------

Description

import_labor

Usage

import_labor(files, export_dir, func = read_bwb_header2)

Arguments

- files vector with full paths of xlsx input files
- export_dir export directory
- func function to be used (default: read_bwb_header2)

Value

list with length equal to number of input files

order_measurement_chain_data
<i>Order Measurement Chain Data</i>

Description

Order Measurement Chain Data

Usage

order_measurement_chain_data(data)

Arguments

- data data frame as retrieved by [read_measurementchains_data](#)

Value

data, ordered by "parameter", "sensor_id", "datum_uhrzeit"

plot_measurementchain_and_well_operation

Plot measurementchain and well operation in combined plot

Description

Plot measurementchain and well operation in combined plot

Usage

```
plot_measurementchain_and_well_operation(
  mc_dat,
  well_op_data_meta,
  brunnen_nr = 9,
  para = "Leitfaehigkeit",
  y_label = "elektr. Leitfähigkeit (µS/cm)",
  date_min = as.Date("2023-05-10"),
  date_max = Sys.Date()
)
```

Arguments

mc_dat	mc_dat
well_op_data_meta	well_op_data_meta
brunnen_nr	well id (default: 9)
para	parameter (either: "Leitfaehigkeit" or "Temperatur")
y_label	y label (default: "elektr. Leitfähigkeit (µS/cm)")
date_min	minimum date for plotting (default: as.Date("2023-05-10"))
date_max	maximum date for plotting (default: Sys.Date())

Value

combined plot

plot_measurementchains

Measurement Chains: plott

Description

Measurement Chains: plott

Usage

```
plot_measurementchains(mc_data, para = "Leitfaehigkeit")
```

Arguments

mc_data as retrieved by [read_measurementchains_data](#)
 para parameter to plot "Leitfaehigkeit" or "Temperatur" (default: Leitfaehigkeit)

Value

plot of selected measurement chain parameter

```
prepare_phreeqc_input    Prepare Phreeqc input
```

Description

Prepare Phreeqc input

Usage

```
prepare_phreeqc_input(lab_bwb_phreeqc, title = "")
```

Arguments

lab_bwb_phreeqc selected BWB lab data as retrieved by [get_phreeqc_data](#)
 title user defined title (default: "")

Value

data frame with input structure for kwb.phreeqc

```
print_datatype_info_if  

                           Helper function: print_datatype_info_if
```

Description

Helper function: print_datatype_info_if

Usage

```
print_datatype_info_if(dbg, tbl_datatypes, columns_keep)
```

Arguments

dbg	dbg
tbl_datatypes	tbl_datatypes
columns_keep	columns_keep

read_bwb_data	<i>Import: read_bwb_data</i>
---------------	------------------------------

Description

wrapper around read_bwb_header2 and read_bwb_header1_meta

Usage

```
read_bwb_data(  
  files,  
  meta_pattern = "META",  
  keep_pattern = column_pattern_gather_ignore(),  
  site_id_pattern = "[0-9]{1,4}",  
  dbg = TRUE  
)
```

Arguments

files	file path(s) to EXCEL spreadsheet
meta_pattern	(default: "META")
keep_pattern	(default: column_pattern_gather_ignore)
site_id_pattern	(default: "[0-9]1,4")
dbg	debug (default: TRUE)

Value

data.table with imported xls(x) files

read_bwb_header1_meta *Import: read_bwb_header1_meta*

Description

Import: read_bwb_header1_meta

Usage

```
read_bwb_header1_meta(
  file,
  meta_pattern = "META",
  keep_pattern = column_pattern_gather_ignore(),
  dbg = FALSE
)
```

Arguments

file	path(s) to EXCEL spreadsheet
meta_pattern	meta_pattern default("META")
keep_pattern	keep_pattern (default: column_pattern_gather_ignore)
dbg	debug (default: FALSE)

Value

data.table with imported xls(x) files

read_bwb_header2 *Import: read_bwb_header2*

Description

Import: read_bwb_header2

Usage

```
read_bwb_header2(
  file,
  skip = 2,
  keep_pattern = column_pattern_gather_ignore(),
  site_id_pattern = "^[0-9]{1,4}",
  dbg = TRUE
)
```

Arguments

file	file path(s) to EXCEL spreadsheet
skip	number of rows to skip in each sheet (default: 2)
keep_pattern	(default: column_pattern_gather_ignore())
site_id_pattern	(default: "[0-9]1,4")
dbg	debug (default: TRUE)

Value

data.table with imported xls(x) files

read_bwb_header4	<i>Import: read_bwb_header4</i>
------------------	---------------------------------

Description

Import: read_bwb_header4

Usage

```
read_bwb_header4(
  file,
  skip = 4,
  keep_pattern = column_pattern_gather_ignore(),
  site_id_pattern = "[0-9]{1,4}",
  dbg = TRUE
)
```

Arguments

file	file path(s) to EXCEL spreadsheet
skip	number of rows to skip in each sheet (default: 4)
keep_pattern	(default: column_pattern_gather_ignore())
site_id_pattern	(default: "[0-9]1,4")
dbg	debug (default: TRUE)

Value

data.table with imported xls(x) files

read_emshoff91_ods	<i>Reads a Single EMSHOFF 91 ODS File into Tibble</i>
--------------------	---

Description

Reads a Single EMSHOFF 91 ODS File into Tibble

Usage

```
read_emshoff91_ods(emshoff91_import_selected)
```

Arguments

emshoff91_import_selected
a row as retrieved by [create_emshoff91_import](#)

Value

imports ods file into tibble

read_isotopes	<i>Read Isotopes</i>
---------------	----------------------

Description

Read Isotopes

Usage

```
read_isotopes(path)
```

Arguments

path path to Isotopes delim (field separator ";")

Value

imported isotopes data

read_lab_bwb	<i>Read Lab BWB</i>
--------------	---------------------

Description

Read Lab BWB

Usage

```
read_lab_bwb(path, sheet = "Analysen")
```

Arguments

path	path to file with lab BWB data
sheet	name of sheet containing analysis data. Default: "Analysen"

Value

cleaned data frame with master data and lab values for all samples but only for selected parameters (columns A-BA and HB-HC)

read_master_data	<i>Read Master Data</i>
------------------	-------------------------

Description

Read Master Data

Usage

```
read_master_data(path)
```

Arguments

path	path to file with master data (currently in file: lab BWB data)
------	---

Value

imported master data contained in sheet "Stammdaten"

`read_measurementchains_data`*Measurement Chains: read csv data from multiple files*

Description

Measurement Chains: read csv data from multiple files

Usage

```
read_measurementchains_data(  
  csv_files,  
  datetime_installation = as_gmt_plus_one("2022-09-27 11:00:00"),  
  run_parallel = TRUE,  
  debug = FALSE  
)
```

Arguments

<code>csv_files</code>	vector of paths as retrieved by download_measurementchains_data
<code>datetime_installation</code>	datetime of first logger installation in well K10. Used to filter out older measurement data! Default: <code>kwb.geosalz:::as_gmt_plus_one("2022-09-27 11:00:00")</code>
<code>run_parallel</code>	default: TRUE
<code>debug</code>	show debug messages (default: FALSE)

Value

data frame with imported data from csv files

Examples

```
## Not run:  
mc_files <- kwb.geosalz::get_measurementchains_files()  
target_directory <- tempdir()  
csv_files <- kwb.geosalz::download_measurementchains_data(  
  sftp_paths = mc_files$sftp_path,  
  target_directory  
)  
mc_data <- kwb.geosalz::read_measurementchains_data(csv_files)  
  
## End(Not run)
```

read_multiple_emshoff91_ods

Reads Multiple EMSHOFF 91 ODS Files into List

Description

Reads Multiple EMSHOFF 91 ODS Files into List

Usage

```
read_multiple_emshoff91_ods(emshoff91_import)
```

Arguments

emshoff91_import

a tibble as retrieved by [create_emshoff91_import](#)

Value

imports multiple ods files into a list of tibbles

Examples

```
## Not run:
ods_dir <- "<replace-with-path-to-files>/emshoff91/emshoff91/converted_ods"
ods_dir <- "C:/users/mrustl/Downloads/emshoff91/emshoff91/converted_ods"
emshoff91_import <- create_emshoff91_import(ods_dir)
read_multiple_emshoff91_ods(emshoff91_import)

## End(Not run)
```

replace_nanb_with_na	<i>Replace n.a. (not available) and n.b. (not determined) from lab data with NA</i>
----------------------	---

Description

Replace n.a. (not available) and n.b. (not determined) from lab data with NA

Usage

```
replace_nanb_with_na(string)
```

Arguments

string	string
--------	--------

Value

string with NA instead of "n.a." or "n.b." (including 0-10 spaces between "n" and "a"/"b")

Examples

```
string <- c("19.2", "n.b.", "n. b.", "n.  b.", "n.a.", "n. a.", "n.  a.")
replace_nanb_with_na(string)
```

safe_office_folder	<i>Helper function: safe_office_folder</i>
--------------------	--

Description

Helper function: safe_office_folder

Usage

```
safe_office_folder(office_path = "C:/Program Files (x86)/Microsoft Office")
```

Arguments

office_path office folder path (default: "C:/Program Files (x86)/Microsoft Office")

Value

path of office folder (if existing)

stop_if_duplicated_samples_found	<i>Helper function: stop if duplicated sample ids are found</i>
----------------------------------	---

Description

Helper function: stop if duplicated sample ids are found

Usage

```
stop_if_duplicated_samples_found(df, col_sampleid, path, sheet = "")
```

Arguments

df	data frame with samples in wide format
col_sampleid	column name of sample id
path	path to file from which df was read (for information only)
sheet	optional in case EXCEL is used (default: "")

Value

error in case duplicated samples were found

stop_on_missing_or_inform_on_extra_sheets

Helper function: stop_on_missing_or_inform_on_extra_sheets

Description

Helper function: stop_on_missing_or_inform_on_extra_sheets

Usage

stop_on_missing_or_inform_on_extra_sheets(has_site_id, file, sheets)

Arguments

has_site_id	has_site_id
file	file
sheets	sheets

to_full_metadata_2

Helper function: to_full_metadata2

Description

Helper function: to_full_metadata2

Usage

to_full_metadata_2(header, file, sheet)

Arguments

header	header
file	file
sheet	sheet

Value

data frame with metadata for header2 (EXCEL) files

to_full_metadata_4	<i>Helper function: to_full_metadata_4</i>
--------------------	--

Description

Helper function: to_full_metadata_4

Usage

```
to_full_metadata_4(header, file, sheet)
```

Arguments

header	header
file	file
sheet	sheet

Value

data frame with metadata for header4 (EXCEL) files

write_measurementchains_data	<i>Measurement Chains: write csv data</i>
------------------------------	---

Description

Measurement Chains: write csv data

Usage

```
write_measurementchains_data(
  mc_data,
  target_directory,
  to_zip = FALSE,
  debug = FALSE
)
```

Arguments

mc_data	measurement chains data as retrieved by read_measurementchains_data
target_directory	target directory
to_zip	should data be zipped? (default: FALSE), if TRUE only a temporary csv file is created which will be subsequently zipped and deleted
debug	print debug messages (default: FALSE)

Value

writes csv data to path

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