

# Package ‘rxylib’

May 10, 2022

**Type** Package

**Title** Import XY-Data into R

**Description** Provides access to the 'xylib' C library for to import xy data from powder diffraction, spectroscopy and other experimental methods.

**Version** 0.2.8.9000-3

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**URL** <https://github.com/R-Lum/rxylib>

**BugReports** <https://github.com/R-Lum/rxylib/issues>

**License** GPL-3 | LGPL-2.1

**Depends** R (>= 4.0),  
utils

**Imports** methods,  
Rcpp (>= 1.0.8)

**Suggests** testthat (>= 3.1.0)

**LinkingTo** Rcpp (>= 1.0.8),  
BH (>= 1.78.0)

**Encoding** UTF-8

**Language** en-GB

**Collate** 'methods\_rxylib.R'  
'rxylib.R'  
'RcppExports.R'  
'read\_xyData.R'  
'convert\_xy2TKA.R'

**RoxygenNote** 7.1.2

## R topics documented:

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|----------------|------------------------------|
| rxylib-package | <i>Import XY-Data into R</i> |
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## Description

Provides access to the 'xylib' C++ library for to import xy data from powder diffraction, spectroscopy and other experimental methods, like gamma-ray spectrometry.

License: GPL-3 | LGPL-2.1 (for the C++ library 'xylib')

## Details

### Funding

Between 2017-2019, the work of Sebastian Kreutzer as maintainer of the package was supported by LabEx LaScArBx (ANR - n. ANR-10-LABX-52).

Supported data formats:

library version: 1.6.0

| ID    | NAME         | DESCRIPTION               | FILE EXTENSION    | VALID_OPTIONS | DATATYPE | BL  |
|-------|--------------|---------------------------|-------------------|---------------|----------|-----|
| [1,]  | cpi          | Sietronics Sieray CPI     | cpi               |               | ascii    | sin |
| [2,]  | uxd          | Bruker Diffrac-AT UXD     | uxd               |               | ascii    | mu  |
| [3,]  | rigaku_dat   | Rigaku DAT                | dat               |               | ascii    | mu  |
| [4,]  | bruker_raw   | Siemens/Bruker RAW        | raw               |               | binary   | mu  |
| [5,]  | bruker_spc   | Bruker ESP300-E SPC       | spc               |               | binary   | sin |
| [6,]  | vamas        | VAMAS ISO-14976           | vms               |               | ascii    | mu  |
| [7,]  | philips_udf  | Philips UDF               | udf               |               | ascii    | sin |
| [8,]  | spe          | PI WinSpec SPE            | spe               |               | binary   | mu  |
| [9,]  | pdCIF        | Powder Diffraction CIF    | cif               |               | ascii    | mu  |
| [10,] | philips_rd   | Philips PC-APD RD/SD      | rd sd             |               | binary   | sin |
| [11,] | xrdml        | PANalytical XRDML         | xrdml             |               | ascii    | mu  |
| [12,] | canberra_mca | Canberra MCA              | mca dat           |               | binary   | sin |
| [13,] | canberra_cnf | Canberra CNF              | cnf               |               | binary   | sin |
| [14,] | xfit_xdd     | XFIT XDD                  | xdd               |               | ascii    | sin |
| [15,] | riet7        | RIET7/LHPM/PSI_DMC        | dat               |               | ascii    | sin |
| [16,] | dbws         | DBWS data                 | dbw rit neu       |               | ascii    | sin |
| [17,] | chiplot      | ChiPLOT data              | chi               |               | ascii    | sin |
| [18,] | spectra      | Spectra / VGX 900         | 1 2 3 4 5 6 7 8 9 |               | ascii    | mu  |
| [19,] | specsxy      | SPECS SpecsLab2 xy        | xy                |               | ascii    | mu  |
| [20,] | csv          | CSV or TSV                | csv tsv tab       | decimal-comma | ascii    | sin |
| [21,] | xsyg         | Freiberg Instruments XSYG | xsyg              |               | ascii    | mu  |

**Author(s)**

Sebastian Kreutzer, Institute of Geography, Heidelberg University (Germany), Johannes Friedrich (University of Bayreuth, Germany), RLum Team (family support), Marcin Wojdyr (maintainer and author of the C++ library xylib), Peng Zhang (author of the C++ library xylib)

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|                |                               |
|----------------|-------------------------------|
| convert_xy2TKA | <i>Convert xy-data to TKA</i> |
|----------------|-------------------------------|

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**Description**

Convert data to the Toolkit file format (TKA) as exported by, e.g., by the software Canberra Genie 2000.

**Usage**

```
convert_xy2TKA(object, file = NULL, overwrite = FALSE)
```

**Arguments**

|           |   |
|-----------|---|
| object    | <a href="#">rxlib</a> ( <b>required</b> ): xy data as imported by the function <a href="#">read_xyData</a> . Optional a file supported by the rxlib-package can be provided as input. Arguments can be provided as <a href="#">list</a> .   |
| file      | <a href="#">character</a> (optional): optional file path or file name for the output to be written. If only a path is provided the output file name is derived from the input file name. Argument can be provided as <a href="#">list</a> . |
| overwrite | <a href="#">logical</a> (with default): force overwriting of existing files if TRUE.  |

**Details****Supported formats**

- Canberra CNF
- further formats on request ...

**Value**

Returns a [list](#) of [matrix](#) objects or an output TKA-file.

**Function version**

0.1.0

**How to cite**

Kreutzer, S., 2022. convert\_xy2TKA(): Convert xy-data to TKA. Function version 0.1.0. In: Kreutzer, S., Friedrich, J., 2022. rxlib: Import XY-Data into R . R package version 0.2.8.9000-3. <https://github.com/R-Lum/rxlib>

**Author(s)**

Sebastian Kreutzer, IRAMAT-CRP2A, Université Bordeaux Montaigne (France)

**Examples**

```
##convert CNF data (no export to file system)
convert_xy2TKA(
  object = system.file("extdata/ExampleSpectrum.CNF", package = "rxylib"))

## Not run:
##export as file

##create temporary filepath
##(for usage replace by own path)
temp_file <- tempfile(pattern = "output", fileext = ".TKA")

##convert and write to file system
convert_xy2TKA(
  object = system.file("extdata/ExampleSpectrum.CNF", package = "rxylib"),
  file = temp_file)

## End(Not run)
```

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methods\_rxylib

*methods\_rxylib*

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**Description**

S3-methods support by the package rxylib. Listed functions can be passed directly into S3 generics (e.g., [plot](#), [print](#)) without reshaping the data.

**Usage**

```
## S3 method for class 'rxylib'
print(x, ...)

## S3 method for class 'rxylib'
plot(x, block = NULL, ...)
```

**Arguments**

|       |   |
|-------|---|
| x     | <b>(required)</b> : input object  |
| ...   | further arguments that can be passed to the method                              |
| block | <a href="#">numeric</a> (with default): select block for plotting, e.g. c(1:2). |

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read\_xyData*Import xy-Data for Supported Formats into R*

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## Description

The function provides access to the underlying `xylib` to import data for supported file formats into R. In most cases, only the file path is needed with further arguments to import the data. The function automatically recognises allowed formats. See [rxylib-package](#) for supported formats.

## Usage

```
read_xyData(file, options = "", verbose = TRUE, metaData = TRUE)
```

## Arguments

|                       |   |
|-----------------------|---|
| <code>file</code>     | <a href="#">character</a> ( <b>required</b> ): path and file to be imported. The argument accepts an URL. |
| <code>options</code>  | <a href="#">character</a> (with default): set format options (see <a href="#">rxylib-package</a> )        |
| <code>verbose</code>  | <a href="#">logical</a> ( <i>with default</i> ): enables/disables verbose mode                            |
| <code>metaData</code> | <a href="#">logical</a> ( <i>with default</i> ): enables/disables the export of metadata                  |

## Value

The functions returns a [list](#) of matrices.

## Function version

0.3.0

## How to cite

Kreutzer, S., Friedrich, J., 2022. `read_xyData()`: Import xy-Data for Supported Formats into R. Function version 0.3.0. In: Kreutzer, S., Friedrich, J., 2022. `rxylib`: Import XY-Data into R . R package version 0.2.8.9000-3. <https://github.com/R-Lum/rxylib>

## Author(s)

Sebastian Kreutzer, IRAMAT-CRP2A, UMR 5060, CNRS - Université Bordeaux Montaigne (France),  
Johannes Friedrich, University of Bayreuth (Germany)

## Examples

```
##load example dataset
file <- system.file("extdata/ExampleSpectrum.CNF", package = "rxylib")
results <- read_xyData(file)
results

##plot xy-spectrum
plot(results,
  type = "l",
  xlab = "Energy [keV]",
  ylab = "Counts",
```

```
main = "Thorite - 1800 s")

mtext(side = 3, "Canberra Inspector 1000, 3 x 3 NaI probe")

##plot contour for TL-spectrum
##imported from an XSYG-file
spectrum <- read_xyData(system.file("extdata/TLspectrum.xsyg", package = "rxylib"))
contour(
  x = spectrum$dataset[[1]]$data_block[,1],
  y = 1:ncol(spectrum$dataset[[1]]$data_block[, -1]),
  z = spectrum$dataset[[1]]$data_block[, -1],
  xlab = "Wavelength [nm]",
  ylab = "#Channel",
  main = "TL Spectrum")
```

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