

# Package ‘rxylib’

August 26, 2024

**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** 0.2.13

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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

**SystemRequirements** C++17

**Depends** R (>= 4.1),  
utils

**Imports** methods,  
Rcpp (>= 1.0.10)

**Suggests** testthat (>= 3.1.4)

**LinkingTo** Rcpp (>= 1.0.10),  
BH (>= 1.81.0)

**Encoding** UTF-8

**Language** en-GB

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

**RoxygenNote** 7.3.2

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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).

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Supported data formats:

library version: 1.6.0

ID	NAME	DESCRIPTION	FILE EXTENSION	VALID_OPTIONS	DATATYPE	BI
[1,]	cpi	Sietronics Sieray CPI	cpi		ascii	sim
[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	sim
[6,]	vamas	VAMAS ISO-14976	vms		ascii	mu
[7,]	philips_udf	Philips UDF	udf		ascii	sim
[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	sim
[11,]	xrdml	PANalytical XRDML	xrdml		ascii	mu
[12,]	canberra_mca	Canberra MCA	mca dat		binary	sim
[13,]	canberra_cnf	Canberra CNF	cnf		binary	sim
[14,]	xfit_xdd	XFIT XDD	xdd		ascii	sim
[15,]	riet7	RIET7/LHPM/PSI_DMC	dat		ascii	sim
[16,]	dbws	DBWS data	dbw rit neu		ascii	sim
[17,]	chiplot	ChiPLOT data	chi		ascii	sim
[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, Ruprecht-Karl-University of Heidelberg (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)

See Also

- Useful links:
- <https://github.com/R-Lum/rxylib>
  - Report bugs at <https://github.com/R-Lum/rxylib/issues>

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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="#">rxylib</a> ( <b>required</b> ): xy data as imported by the function <a href="#">read_xyData</a> . Optional a file supported by the rxylib-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**

0.1.1

**How to cite**

Kreutzer, S., 2024. convert\_xy2TKA(): Convert xy-data to TKA. Function version 0.1.1. In: Kreutzer, S., Friedrich, J., 2024. rxylib: Import XY-Data into R . R package version 0.2.13. <https://github.com/R-Lum/rxylib>

**Author(s)**

Sebastian Kreutzer, Institute of Geography, Universität Heidelberg, Germany

**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. <code>c(1:2)</code> .

read\_xyData

*Import xy-Data for Supported Formats into R***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**

file	<a href="#">character</a> ( <b>required</b> ): path and file to be imported. The argument accepts an URL. Can be <a href="#">character</a> vector or a <a href="#">list</a> of characters.
options	<a href="#">character</a> (with default): set format options (see <a href="#">rxylib-package</a> )
verbose	<a href="#">logical</a> ( <i>with default</i> ): enables/disables verbose mode
metaData	<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., 2024. `read_xyData()`: Import xy-Data for Supported Formats into R. Function version 0.3.0. In: Kreutzer, S., Friedrich, J., 2024. `rxylib`: Import XY-Data into R . R package version 0.2.13. <https://github.com/R-Lum/rxylib>

**Author(s)**

Sebastian Kreutzer, Institute of Geography, Ruprecht-Karl-University of Heidelberg (Germany),  
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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