Package 'SorptionAnalysis'

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Type Package

Title Static Adsorption Experiment Plotting and Analysis

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Description Provides tools to efficiently analyze and visualize laboratory data from aqueous static adsorption experiments. The package provides functions to plot Langmuir, Freundlich, and Temkin isotherms and functions to determine the statistical conformity of data points to the Langmuir, Freundlich, and Temkin adsorption models through statistical characterization of the isothermic least squares regressions lines. Scientific Reference: Dada, A.O, Olalekan, A., Olatunya, A. (2012) <doi:10.9790/5736-0313845>.

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freundlichanalysis *Describes the conformity of the results from a static adsorption experiment to the Freundlich Isotherm model*

Description

Describes the conformity of the results from a static adsorption experiment to the Freundlich Isotherm model

Usage

```
freundlichanalysis(Ce, Qe)
```

Arguments

Ce	A numeric vector consisting of equilibrium concentration values
Qe	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The residuals, y - intercept, coefficient, and correlation factor of the LSRL based on the Temkin isotherm model

Examples

```
freundlichanalysis(c(1,2,3,4), c(1,2,3,4))
```

freundlichplot *Plots a Freundlich Isotherm using results from a static adsorption experiment*

Description

Plots a Freundlich Isotherm using results from a static adsorption experiment

Usage

```
freundlichplot(Ce, Qe)
```

Arguments

Ce	A numeric vector consisting of equilibrium concentration values
Qe	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The plot of log(Ce) against log(Qe) with the LSRL displayed

Examples

```
freundlichplot(c(1,2,3,4), c(1,2,3,4))
```

`langmuiranalysis` *Describes the conformity of the results from a static adsorption experiment to the Langmuir Isotherm model*

Description

Describes the conformity of the results from a static adsorption experiment to the Langmuir Isotherm model

Usage

```
langmuiranalysis(Ce, Qe)
```

Arguments

`Ce`	A numeric vector consisting of equilibrium concentration values
`Qe`	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The residuals, y - intercept, coefficient, and correlation factor of the LSRL based on the Temkin isotherm model

Examples

```
langmuiranalysis(c(1,2,3,4), c(1,2,3,4))
```

`langmuirplot` *Plots a Langmuir Isotherm using results from a static adsorption experiment*

Description

Plots a Langmuir Isotherm using results from a static adsorption experiment

Usage

```
langmuirplot(Ce, Qe)
```

Arguments

`Ce`	A numeric vector consisting of equilibrium concentration values
`Qe`	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The plot of 1 over Ce against 1 over Qe with the LSRL displayed

Examples

```
langmuirplot(c(1,2,3,4), c(1,2,3,4))
```

`summaryanalysis` *Describes the conformity of the results from a static adsorption experiment to the Langmuir, Freundlich, and Temkin Isotherm model*

Description

Describes the conformity of the results from a static adsorption experiment to the Langmuir, Freundlich, and Temkin Isotherm model

Usage

```
summaryanalysis(Ce, Qe)
```

Arguments

`Ce`	A numeric vector consisting of equilibrium concentration values
`Qe`	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The residuals, y - intercept, coefficient, and correlation factor of the LSRL based on the Langmuir, Freundlich, and Temkin isotherm model

Examples

```
summaryanalysis(c(1,2,3,4), c(1,2,3,4))
```

`summaryplots` *Plots the three different Isotherm models using results from a static adsorption experiment*

Description

Plots the three different Isotherm models using results from a static adsorption experiment

Usage

```
summaryplots(Ce, Qe)
```

Arguments

`Ce`	A numeric vector consisting of equilibrium concentration values
`Qe`	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The plots of Langmuir, Freundlich, and Temkin Isotherms

Examples

```
summaryplots(c(1,2,3,4), c(1,2,3,4))
```

`temkinanalysis` *Describes the conformity of the results from a static adsorption experiment to the Temkin Isotherm model*

Description

Describes the conformity of the results from a static adsorption experiment to the Temkin Isotherm model

Usage

```
temkinanalysis(Ce, Qe)
```

Arguments

Ce	A numeric vector consisting of equilibrium concentration values
Qe	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The residuals, y - intercept, coefficient, and correlation factor of the LSRL based on the Temkin isotherm model

Examples

```
temkinanalysis(c(1,2,3,4), c(1,2,3,4))
```

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temkinplot *Plots a Temkin Isotherm using results from a static adsorption experiment*

Description

Plots a Temkin Isotherm using results from a static adsorption experiment

Usage

```
temkinplot(Ce, Qe)
```

Arguments

Ce	A numeric vector consisting of equilibrium concentration values
Qe	A numeric vector consisting of quantities adsorbed at equilibrium

Value

The plot of ln(Ce) against Qe with the LSRL displayed

Examples

```
temkinplot(c(1,2,3,4), c(1,2,3,4))
```

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