

# Package ‘SorptionAnalysis’

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**Type** Package

**Title** Static Adsorption Experiment Plotting and Analysis

**Version** 0.1.0

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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](https://doi.org/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*

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**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))
```

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

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**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  $\log(C_e)$  against  $\log(Q_e)$  with the LSRL displayed

**Examples**

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

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langmuiranalysis	<i>Describes the conformity of the results from a static adsorption experiment to the Langmuir Isotherm model</i>
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**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))
```

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

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**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))
```

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summaryplots	<i>Plots the three different Isotherm models using results from a static adsorption experiment</i>
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**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))
```

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temkinanalysis	<i>Describes the conformity of the results from a static adsorption experiment to the Temkin Isotherm model</i>
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**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))
```

---

temkinplot	<i>Plots a Temkin Isotherm using results from a static adsorption experiment</i>
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**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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