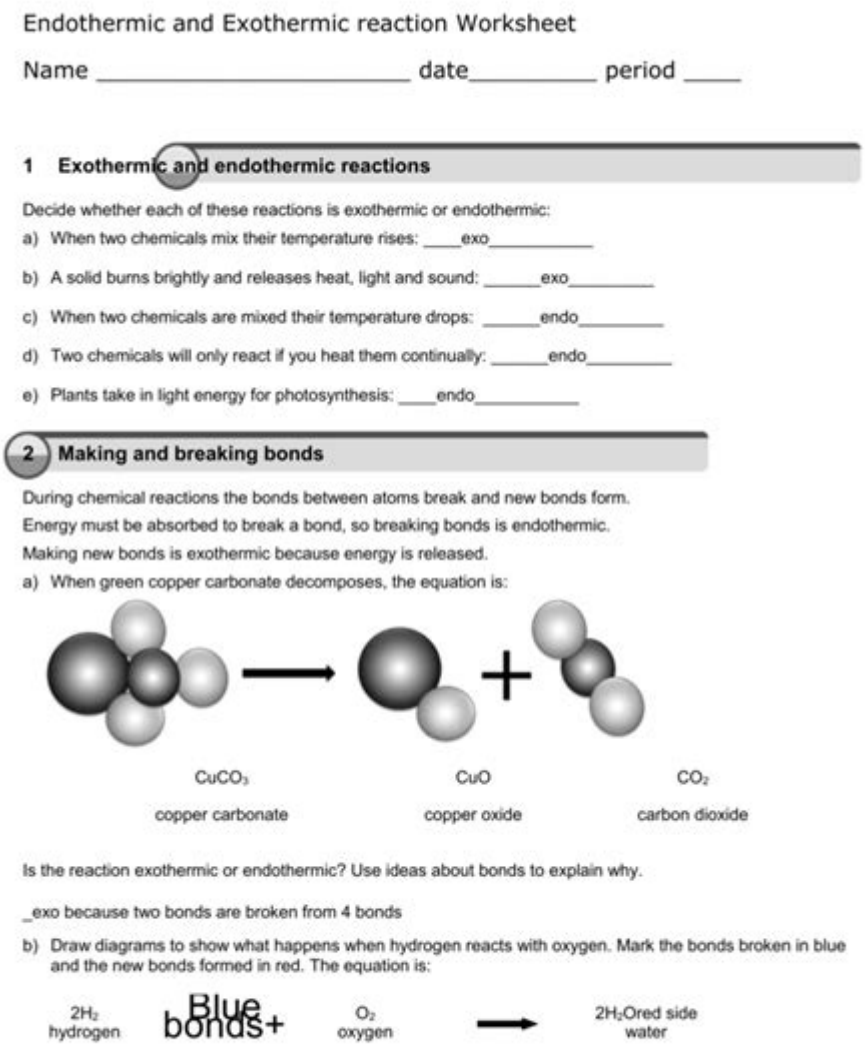
Endothermic And Exothermic Reactions Worksheet With Answers



Endothermic and Exothermic reaction Worksheet

Name _____ date_____ period ____

1 Exothermic and endothermic reactions

Decide whether each of these reactions is exothermic or endothermic:

a) When two chemicals mix their temperature rises: ____exo_____

b) A solid burns brightly and releases heat, light and sound: _____exo_____

c) When two chemicals are mixed their temperature drops: _____endo_____

d) Two chemicals will only react if you heat them continually: _____endo_____

e) Plants take in light energy for photosynthesis: ____endo_____

2 Making and breaking bonds

During chemical reactions the bonds between atoms break and new bonds form.
Energy must be absorbed to break a bond, so breaking bonds is endothermic.
Making new bonds is exothermic because energy is released.

a) When green copper carbonate decomposes, the equation is:

$CuCO_3$ copper carbonate — CuO copper oxide — CO_2 carbon dioxide

Is the reaction exothermic or endothermic? Use ideas about bonds to explain why.

_exo because two bonds are broken from 4 bonds

b) Draw diagrams to show what happens when hydrogen reacts with oxygen. Mark the bonds broken in blue and the new bonds formed in red. The equation is:

$2H_2$ hydrogen — Blue bonds+ — O_2 oxygen → $2H_2O$red side water

Endothermic and Exothermic Reactions Worksheet with Answers

Understanding endothermic and exothermic reactions is fundamental in the field of chemistry. These reactions describe how energy is absorbed or released during chemical processes, and they play critical roles in various scientific and practical applications. This comprehensive guide will cover the definitions, characteristics, examples, and a worksheet complete with answers to help reinforce your understanding of these essential concepts.

What are Endothermic Reactions?

Endothermic reactions are chemical reactions that absorb energy, usually in the form of heat, from their surroundings. This absorption of energy results in a decrease in the temperature of the surrounding environment.

Characteristics of Endothermic Reactions

1. Energy Absorption: Energy is absorbed from the surroundings.
2. Temperature Change: The temperature of the surroundings decreases.
3. Positive Enthalpy Change: The enthalpy change (□H) for endothermic reactions is positive.
4. Examples: Common examples include photosynthesis, the dissolution of ammonium nitrate in water, and the thermal decomposition of calcium carbonate.

Common Examples

- Photosynthesis: Plants absorb sunlight to convert carbon dioxide and water into glucose and oxygen.
- Dissolution of Salts: The dissolution of ammonium nitrate in water is an endothermic process that absorbs heat, resulting in a cooler solution.
- Baking Soda and Vinegar Reaction: When baking soda (sodium bicarbonate) reacts with vinegar (acetic acid), it absorbs heat from the environment.

What are Exothermic Reactions?

Exothermic reactions, on the other hand, are chemical reactions that release energy into their surroundings. This release typically occurs in the form of heat, resulting in an increase in the

temperature of the surroundings.

Characteristics of Exothermic Reactions

1. Energy Release: Energy is released into the environment.
2. Temperature Change: The temperature of the surroundings increases.
3. Negative Enthalpy Change: The enthalpy change (ΔH) for exothermic reactions is negative.
4. Examples: Common examples include combustion reactions, respiration, and the reaction of acids with bases.

Common Examples

- Combustion of Fuels: When hydrocarbons combust, they release carbon dioxide, water, and energy.
- Respiration: The metabolic process in organisms where glucose reacts with oxygen to produce carbon dioxide, water, and energy.
- Neutralization Reactions: When an acid reacts with a base, heat is often produced, exemplifying an exothermic process.

Comparison of Endothermic and Exothermic Reactions

Feature	Endothermic Reactions	Exothermic Reactions
Energy Change	Absorbs energy	Releases energy
Temperature Effect	Decreases the temperature	Increases the temperature
Enthalpy Change (ΔH)	Positive	Negative
Common Examples	Photosynthesis, melting ice	Combustion, respiration

Worksheet: Endothermic and Exothermic Reactions

Below is a worksheet designed to test your understanding of endothermic and exothermic reactions. The questions range from multiple-choice to short answer formats.

Questions

1. Define endothermic and exothermic reactions.

2. Which of the following is an example of an endothermic reaction?

a) Burning wood

b) Dissolving salt in water

c) Respiration

d) Rusting of iron

3. What happens to the temperature of the surroundings during an exothermic reaction?

4. Write the general equation for an exothermic reaction.

5. Explain why photosynthesis is considered an endothermic reaction.

6. Identify the enthalpy change (ΔH) sign for endothermic and exothermic reactions.

7. List two real-life applications of exothermic reactions.

8. Complete the following statements:

a) In an endothermic reaction, the products have _____ energy than the reactants.

b) In an exothermic reaction, the reactants have _____ energy than the products.

Answers

1. Endothermic reactions are those that absorb energy from their surroundings, while exothermic reactions release energy into their surroundings.

2. b) Dissolving salt in water.

3. The temperature of the surroundings increases during an exothermic reaction.

4. A general equation for an exothermic reaction can be represented as:
Reactants → Products + Energy

5. Photosynthesis is considered an endothermic reaction because plants absorb sunlight (energy) to convert carbon dioxide and water into glucose and oxygen.

6. The enthalpy change (ΔH) for endothermic reactions is positive, while for exothermic reactions, it is negative.

7. Two real-life applications of exothermic reactions include:
- The combustion of fuels for energy production.
- The heat generated during the neutralization of acids and bases.

8.
a) In an endothermic reaction, the products have more energy than the reactants.
b) In an exothermic reaction, the reactants have more energy than the products.

Conclusion

Endothermic and exothermic reactions are essential concepts in chemistry that have significant

implications in various fields, including environmental science, biology, and engineering. Understanding the energy changes involved in these reactions helps us grasp fundamental principles of chemical reactions and their applications in everyday life. The worksheet provided is a useful tool for reinforcing this knowledge, allowing students and enthusiasts alike to test their understanding and apply what they have learned. By mastering these concepts, one can better appreciate the dynamic nature of chemical processes and their impact on the world around us.

Frequently Asked Questions

What is an endothermic reaction?

An endothermic reaction is a chemical reaction that absorbs heat from its surroundings, resulting in a decrease in temperature in the environment.

What is an exothermic reaction?

An exothermic reaction is a chemical reaction that releases heat, causing an increase in temperature in the surroundings.

How can you identify an endothermic reaction in a worksheet?

You can identify an endothermic reaction by looking for reactions that require heat input or have a positive change in enthalpy ($\Delta H > 0$).

What are some common examples of exothermic reactions?

Common examples include combustion reactions, such as burning fuel, and respiration in living organisms.

How do energy diagrams represent endothermic and exothermic

reactions?

Energy diagrams show the energy of reactants and products; in endothermic reactions, the products have higher energy than reactants, while in exothermic reactions, the products have lower energy.

What is the significance of activation energy in these reactions?

Activation energy is the minimum energy required to initiate a reaction; both endothermic and exothermic reactions require activation energy to proceed.

How can temperature changes be observed in an endothermic reaction?

In an endothermic reaction, the temperature of the surroundings decreases, which can be measured with a thermometer or observed through other thermal changes.

What role do catalysts play in endothermic and exothermic reactions?

Catalysts lower the activation energy required for both endothermic and exothermic reactions, allowing them to proceed more quickly without being consumed in the process.

How can you experimentally determine if a reaction is exothermic or endothermic?

You can experimentally determine the nature of the reaction by measuring the temperature change of the surroundings before and after the reaction occurs.

What is a common endothermic reaction that students might study?

A common endothermic reaction studied in classrooms is the reaction of baking soda with vinegar, which absorbs heat and feels cold to the touch.

Endothermic And Exothermic Reactions Worksheet With Answers

社会医療法人禎心会 札幌禎心会病院
May 1, 2025・札幌市にある社会医療法人禎心会、札幌禎心会病院のトップページです。三大疾病（がん、脳卒中、心臓病）に加え、未病の段階にもしっかり取り組んでこの使命を全うし地 …

病院概要｜社会医療法人禎心会札幌禎心会病院
札幌市にある社会医療法人禎心会、札幌禎心会病院の病院概要ページです。健康寿命を延ばしていくのが我々の使命です。三大疾病（がん、脳卒中、心臓病）に加え、未病の段階にもしっ …

診療科・部門｜社会医療法人禎心会 札幌禎心会病院
札幌禎心会病院の診療科目・部門一覧ページです。各診療科ごとの主な対象疾患をご紹介しております。診療科・部門の詳細はこちらのページをご覧ください。※外来診療のご予約はお …

当院について｜社会医療法人禎心会札幌禎心会病院
札幌市にある札幌禎心会病院は、医療介護複合体である禎心会グループの基幹病院です。三大疾病を中心に、専門性の高い医療を提供し良質な医療・介護を通じて、地域社会の繁栄に貢献 …

受診される方｜社会医療法人禎心会 札幌禎心会病院
札幌禎心会病院にご来院される方への詳細ページです。外来受診の流れについて記載しています。※来院前の問診票のご入力により待ち時間を短縮することができます。また、電話での …

ご挨拶｜社会医療法人禎心会 札幌禎心会病院
「札幌禎心会病院」は、医療介護複合体である禎心会グループの基幹病院です。 1984年の「禎心会病院」創業以来、人口26万人を超える札幌市東区において、脳卒中を中心とした専門的医 …

医師検索｜社会医療法人禎心会札幌禎心会病院
院長、社会医療法人禎心会理事長 徳田禎久 とくださだひさ … 脳神経外科 院長代行、脳卒中センター センター長 谷川緑野 たにかわろくや … 脳神経外科 脊椎・脊髄末梢神経外科（専門外 …

交通アクセス｜社会医療法人禎心会 札幌禎心会病院
札幌市東区の札幌禎心会病院への交通アクセス詳細ページです。地下鉄、バス、車、空港からのアクセスを紹介しています。

外来担当医表｜社会医療法人禎心会 札幌禎心会病院
月・水・木・金の午後は、他医療機関（クリニック・診療所・病院など）からの紹介状（診療情報提供書）をご持参の場合、予約なしでも診察可能です。

札幌禎心会病院 法人サイト - トップページ｜社会医療法人禎 …
1984年に札幌市東区で開設された禎心会病院を母体とし、がん・脳卒中・心臓病などの三大疾患を中心に、高齢化社会に対応するサービスを提供しています。

45/128 Adelaide Terrace, East Perth, WA 6004 - realestate.com.au

45/128 Adelaide Terrace, East Perth, WA 6004 has a land size of 85 m². It is a unit that was built in 2006 with 1 bedroom, 1 bathroom, and 1 parking space. Median property prices in East Perth over the last year range from $1,300,000 for houses to $544,000 for units.

Building profile - 128 Adelaide Tce, East Perth WA 6004

128 Adelaide Tce, East Perth WA 6004 has 105 properties. Find out what's currently on the market and view the full sale history online. Thinking of making a move?.

45/128 Adelaide Terrace, East Perth WA 6004 - property.com.au
Property data for 45/128 Adelaide Terrace, East Perth WA 6004. Get sold price history and market data for real estate in East Perth WA.

45/128 Adelaide Terrace East Perth WA 6004 - On The House
45/128 Adelaide Tce, East Perth is a 1 bedroom, 1 bathroom Unit and was built in 2007. The property has a land size of 85 and floor size of 52m2.While the property is not currently for sale or for rent, it was last sold in September 2013.

128 Adelaide Terrace, East Perth, WA 6004 - realestate.com.au
128 Adelaide Terrace, East Perth, WA 6004 It is a house that was built in 2006 with 3 bedrooms, 2 bathrooms, and 1 parking space. Median property prices in East Perth over the last year range from $1,380,000 for houses to $550,500 for units.

45/128 Adelaide Terrace, East Pert | Property History & Address ...
Get Property Sale History and Research Schools for 45/128 Adelaide Terrace, East Perth WA 6004 . Follow this Address and explore Price Estimations, Demand & Real Estate insights on Domain.

58/128 Adelaide Terrace, East Perth WA 6004 - KA-CHENG
Upgrade Your City Lifestyle Apartment Sold - East Perth WA All offers presented on or before 04/11/2024. Owner reserves the right to accept any offer prior to this date. Looking to take your city lifestyle to the next level? This stunning one-bedroom, one-bathroom apartment at 58/128 Adelaide Terrace, East Perth, offers the perfect blend of style and convenience. Located right …

64/128 Adelaide Terrace, East Perth, WA 6004 - realestate.com.au
2 days ago · 1 bedroom apartment for sale at 64/128 Adelaide Terrace, East Perth, WA 6004, $468,000. View 28 property photos, floor plans and East Perth suburb information.

102/128 Adelaide Terrace, East Perth WA 6004 | Domain
Jul 13, 2025 · 1 bedroom apartment for Sale at 102/128 Adelaide Terrace, East Perth WA 6004. View property photos, floor plans, local school catchments & lots more on Domain.com.au. 2020107287

FL 9 45/128 Adelaide Terrace, East Perth, WA 6004 - realestate.com.au
FL 9 45/128 Adelaide Terrace, East Perth, WA 6004 has a land size of 2,675 m^2. It is a unit that was built in 2006 with 1 bedroom, 1 bathroom, and 1 parking space. It was sold in 2013 for $428,000 by Arena Real Estate Agents - PERTH. Median property prices in East Perth over the last year range from $1,300,000 for houses to $544,000 for units.

26/128 Adelaide Terrace, East Perth, WA 6004 - realestate.com.au
3 bedroom apartment for sale at 26/128 Adelaide Terrace, East Perth, WA 6004, UNDER OFFER IN 1st HOME OPEN. View 35 property photos, floor plans and East Perth suburb information.

57/128 Adelaide Terrace, East Perth, WA 6004 - Property Details
Jun 13, 2025 · 57/128 Adelaide Terrace, East Perth, WA 6004. View property details and sold price of 57/128 Adelaide Terrace & other properties in East Perth, WA 6004.

Back to Home