Intensive And Extensive Properties Worksheet

Intensive or Extensive Property

Directions: Identify the properties below as intensive or extensive.

Ex: The volume of Earth is 259,875,159,532 mi³. Extensive

1. One mole of carbon has a mass of 12.01 grams. _____
2. The density of diesel fuel is 0.85 kg/L _____
3. The circumference of Earth is 24,901 miles _____
4. An American football field is 100 yards long. _____
5. Iron ore is red. _____
6. An olympic barbell has a mass of 20 kg. _____
7. Diamond blades are very hard. _____
8. Copper can be stretched into thin wire. _____
9. The school bus traveled at 25 mph _____
10. The pressure inside a school bus tire is 45 psi. _____
11. Turmeric has a distinctive smell. _____
12. Steel can be pounded into a flat sheet. _____
13. Sulfur is brittle. _____
14. The melting point of sulfur is 115°C. _____
15. Each waiter poured 8 oz of water. _____
16. The stove was 200°C. _____
17. A European football field is 115 yards long. _____
18. Polished gold is shiny. _____

Intensive or Extensive Property 1
© Black Pocket Science

Intensive and extensive properties worksheet are essential tools in the study of physical sciences, particularly in chemistry and physics. Understanding the distinction between intensive and extensive properties is crucial for students and professionals alike as they engage with various materials and their behaviors under different conditions. This article aims to provide a comprehensive overview of intensive and extensive properties, their definitions, examples, and applications, as well as how to effectively utilize a worksheet to differentiate and categorize these properties.

Understanding Properties of Matter

In physical sciences, properties of matter are characteristics that can be observed or measured. These properties can be classified into two main categories: intensive properties and extensive properties. The differentiation is based on how these properties change when the amount of substance in question changes.

Intensive Properties

Intensive properties are those that do not depend on the amount of substance present. These properties remain constant regardless of the size or mass of the system. They are intrinsic to the material itself and can be used to identify substances.

Examples of Intensive Properties:

1. Density: The mass per unit volume of a substance, which often remains constant for a given material.
2. Color: The visual perception of light reflected by a substance, independent of its quantity.
3. Boiling Point: The temperature at which a substance transitions from a liquid to a gas, characteristic of the substance itself.
4. Melting Point: The temperature at which a solid becomes a liquid.
5. Hardness: A measure of a material's resistance to deformation or scratching.
6. Electrical Conductivity: The ability of a substance to conduct electricity.
7. Solubility: The ability of a substance to dissolve in a solvent.

Extensive Properties

In contrast, extensive properties depend on the amount of substance present. These properties change when the size or quantity of the system changes. Extensive properties are often additive; for example, the total mass of a substance is the sum of the masses of its parts.

Examples of Extensive Properties:

1. Mass: The quantity of matter in an object, which increases with the amount of substance.
2. Volume: The amount of space occupied by a substance, which also increases with the quantity of the substance.
3. Total Energy: The sum of kinetic and potential energy in a system, which varies with the amount of material.
4. Length: The measurement of distance, which increases linearly with the amount of material.
5. Entropy: A measure of the disorder or randomness in a system, which can vary with the amount of substance.

Worksheet Activities for Understanding Properties

Utilizing a worksheet can significantly enhance the understanding of intensive and extensive properties. Here are some activities that can be included in an intensive and extensive properties worksheet:

Activity 1: Classification Exercise

Provide students with a list of various properties and ask them to classify each as either intensive or extensive. For example:

- Density
- Length
- Temperature
- Mass
- Color
- Volume
- Boiling Point
- Total Energy

Instructions:
- Create two columns labeled "Intensive Properties" and "Extensive Properties."
- Ask students to write each property in the appropriate column.
- Discuss the answers as a class to reinforce understanding.

Activity 2: Real-World Examples

In this activity, students will explore real-world examples of intensive and extensive properties.

Instructions:
1. Ask students to find examples of both types of properties in everyday materials (e.g., water, aluminum, wood).
2. Students should provide at least three examples of intensive properties and three examples of extensive properties.
3. Encourage students to share their findings with the class and explain why each property is classified as intensive or extensive.

Activity 3: Experimentation

Conduct a simple experiment to illustrate the difference between intensive and extensive properties.

Instructions:
1. Take a sample of water and measure its mass and volume. Record the results.
2. Divide the sample into two equal parts and measure the mass and volume of each part.
3. Measure the temperature of the water before and after dividing it.
4. Discuss the results as a class. Students should observe that mass and volume changed with the division (extensive properties), while temperature remained the same (intensive property).

The Importance of Distinguishing Between Intensive and Extensive Properties

Understanding the distinction between these two types of properties is fundamental in

various fields, including chemistry, engineering, and materials science. Here are some reasons why this knowledge is crucial:

1. Material Identification

Intensive properties are often used to identify materials. For instance, the boiling point and density can help distinguish between different substances. This is particularly important in laboratory settings where accurate identification is critical.

2. Thermodynamic Calculations

In thermodynamics, the distinction between intensive and extensive properties is vital for calculations involving energy, temperature, and pressure. For example, when calculating the total energy of a system, knowing which properties are extensive allows for accurate summation.

3. Chemical Reactions

In chemical reactions, understanding which properties are intensive or extensive can influence the prediction of reaction outcomes. For example, the concentration of a reactant is an intensive property that can affect reaction rates.

4. Engineering Applications

In engineering, knowing the properties of materials helps in designing systems and structures. For example, the density of materials is critical when considering weight and stability in construction.

Conclusion

A well-structured intensive and extensive properties worksheet can greatly enhance comprehension of these fundamental concepts in physical sciences. By participating in activities that involve classification, real-world examples, and experimentation, students can gain a deeper understanding of how these properties affect the behavior of materials. The ability to distinguish between intensive and extensive properties is not only an academic exercise but a crucial skill in various scientific and engineering applications. As students continue their education, this foundational knowledge will serve them well in more advanced studies and real-world problem-solving scenarios.

Frequently Asked Questions

What are intensive properties in the context of a chemistry worksheet?

Intensive properties are characteristics of a substance that do not depend on the amount of material present. Examples include density, boiling point, and color.

How do extensive properties differ from intensive properties?

Extensive properties depend on the quantity of material present. Examples include mass, volume, and total energy.

Why is it important to distinguish between intensive and extensive properties in scientific studies?

Distinguishing between these properties helps in understanding how substances behave under different conditions and in calculations related to thermodynamics and material science.

Can a property be both intensive and extensive under different conditions?

No, a property is classified as either intensive or extensive based on its dependence on the amount of substance. However, some properties may change depending on the state of matter or temperature.

What are some common examples of intensive properties found in a worksheet exercise?

Common examples include melting point, hardness, conductivity, and refractive index.

How can a worksheet help students understand the difference between intensive and extensive properties?

A worksheet can provide exercises that require students to classify different properties, perform calculations, and apply concepts in real-world scenarios, reinforcing their understanding.

Intensive And Extensive Properties Worksheet

intensive 什么意思_百度知道
intensive意思: adj. 密集的; 彻底的; 精细的; 强调的 n. (语法)强调成分 一、读音: 英 [ɪn'tensɪv]; 美 [ɪn'tensɪv] 二、例句: This patient requires intensive care. 该病人需要加强护 …

请问Intensive property和Extensive property的基本差别是什么?
请问Intensive property和Extensive property的基本差别是什么? 关注者 2 被浏览

intense和**intensive**都是强烈的意思,怎么区分啊_百度知道
Jul 7, 2024 · intense和intensive都是强烈的意思,怎么区分啊答案: intense和intensive虽然都有强烈的意思，但它们的用法和含义有所区别。详细解释: 1. 词性不同intense是一个形容词，用来 …

“extensive margin” 和 *“intensive margin”* 如何典雅地翻译? - 知乎
“extensive margin” 和 “intensive margin” 如何典雅地翻译? extensive margin和intensive margin是经济学里常用的两个词。例子1：一个公司雇佣多少员工是extensive marg... 显示全部 关注者 …

《设计数据密集型应用》一书有没有比较好的学习方法? - 知乎
《设计数据密集型应用》中文版已经出了。我看了3遍，对这本书的看法变了3次： 1、第一遍 快速翻了一遍，9分：很详细的讲解了 数据处理的一些概念和对这些概念的含义、引申出来的各种 …

如何知道一个期刊是不是**sci**? - 知乎
欢迎大家持续关注InVisor学术科研！喜欢记得 点赞收藏转发！双击屏幕解锁快捷功能～ 如果大家对于「SCI/SSCI期刊论文发表」「SCOPUS 、CPCI/EI会议论文发表」「名校科研助理申请」 …

想问一下剑桥 *MPhil in Data Intensive Science* 是什么专业的?
想问一下剑桥 MPhil in Data Intensive Science 是什么专业的? 最近conditional offer 下来了，想问一下，感觉面试半个月就出来，这个master 的含金量如何? 本人澳洲本科荣誉学位，放弃 …

为什么呼吸内科要改呼吸与危重症医学科呢? - 知乎
危重症监护治疗病房（Intensive Care Unit, ICU）是呼吸衰竭救治之所。呼吸内科更名为呼吸与危重症医学科（Department of Respiratory and Critical Care Medicine），承担呼吸疾病诊治 …

什么是广延量，什么是强度量? - 知乎
Oct 4, 2020 · 凡是跟著质点数量成正比的量，叫作广延量，例如体积。广延量 除以 质点数，消去了数量的影响，表达了一个单位的性质，叫做强度量，例如密度。在哲学称此二者为外延量 …

请问**UCL scientific and data intensive computing**专业怎么样?
其次为什么这个专业19fall的时候叫做Scientific Computing，然后20fall的时候改名字叫做Scientific and Data Intensive Computing的原因我想很多人也猜到了，就是为了拉生源，因为英国人非常 …

intensive 什么意思_百度知道
intensive意思: adj. 密集的; 彻底的; 精细的; 强调的 n. (语法)强调成分 一、读音: 英 [ɪn'tensɪv]; 美 [ɪn'tensɪv] 二、例句: This patient requires intensive care. 该病人需要加强护 …

请问**Intensive property**和**Extensive property**的基本差别是什么?
请问Intensive property和Extensive property的基本差别是什么? 关注者 2 被浏览

*intense*和*intensive*都是强烈的意思,怎么区分啊_百度知道

Jul 7, 2024 · intense和intensive都是强烈的意思,怎么区分啊答案: intense和intensive虽然都有强烈的意思，但它们的用法和含义有所区别。详细解释: 1. 词性不同intense是一个形容词，用来 …

“extensive margin” 和 “intensive margin” 如何典雅地翻译? - 知乎
“extensive margin” 和 “intensive margin” 如何典雅地翻译? extensive margin和intensive margin是经济学里常用的两个词。例子1：一个公司雇佣多少员工是extensive marg… 显示全部 关注者 …

《设计数据密集型应用》一书有没有比较好的学习方法? - 知乎
《设计数据密集型应用》中文版已经出了。我看了3遍，对这本书的看法变了3次： 1、第一遍 快速翻了一遍，9分：很详细的讲解了数据处理的一些概念和对这些概念的含义、引申出来的各种 …

如何知道一个期刊是不是sci? - 知乎
欢迎大家持续关注InVisor学术科研！喜欢记得 点赞收藏转发！双击屏幕解锁快捷功能～ 如果大家对于「SCI/SSCI期刊论文发表」「SCOPUS 、CPCI/EI会议论文发表」「名校科研助理申请」 …

想问一下剑桥 MPhil in Data Intensive Science 是什么专业的?
想问一下剑桥 MPhil in Data Intensive Science 是什么专业的? 最近conditional offer 下来了，想问一下，感觉面试半个月就出来，这个master 的含金量如何? 本人澳洲本科荣誉学位，放弃 …

为什么呼吸内科要改呼吸与危重症医学科呢? - 知乎
危重症监护治疗病房（Intensive Care Unit, ICU）是呼吸衰竭救治之所。呼吸内科更名为呼吸与危重症医学科（Department of Respiratory and Critical Care Medicine），承担呼吸疾病诊治 …

什么是广延量，什么是强度量? - 知乎
Oct 4, 2020 · 凡是跟著质点数量成正比的量，叫作广延量，例如体积。广延量 除以 质点数，消去了数量的影响，表达了一个单位的性质，叫做强度量，例如密度。在哲学称此二者为外延量 …

请问UCL scientific and data intensive computing专业怎么样?
其次为什么这个专业19fall的时候叫做Scientific Computing，然后20fall的时候改名字叫做Scientific and Data Intensive Computing的原因我想很多人也猜到了，就是为了拉生源，因为英国人非常 …

Explore our comprehensive intensive and extensive properties worksheet to enhance your understanding of these key concepts. Learn more and boost your knowledge today!

Back to Home