

Vorschau

Weekly Task - TU9 - Kopie

Datum: Mon Aug 31 16:21:02 2015 Maximale Punktezahl: 12

1. Dry Air vs. Humid Air (1 Punkt)

In this task we want to work with a common misconception, related to the behaviour of a very common material we all know: AIR. We would like to know, which one has more weight?

- Humid Air
 Dry Air

2. Dry Air vs. Humid Air - Reason (1 Punkt)

Please give a reason for your choice.

3. Composition of Air 1 (1 Punkt)

Before we satisfy you with a simple answer, we would like to approach the topics related to this question. They may ultimately lead to a comprehensive understanding why air weighs more than air. Firstly, let's look at the elements of air. We would like to know which are the main components (99,96%) of dry air? (Please enter complete words, no symbols or abbreviations)

1.
2.
3.

4. Composition of Air 2 (1 Punkt)

Of course there are many more elements that you can find in dry air. However, the four most abundant ones within dry air are not evenly distributed. To answer this question, please order the elements by their abundance, beginning with the most abundant on top.

[Positionen der Definitionen zurücksetzen](#)

Nitrogen

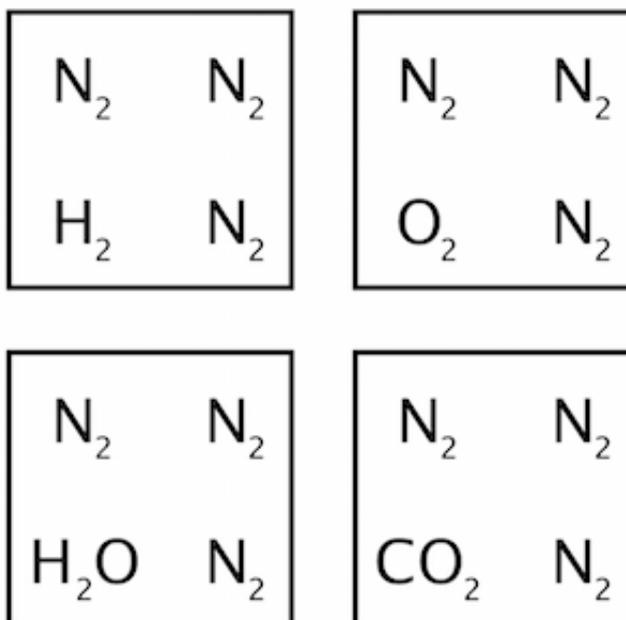
Argon

Oxygen

Carbon Dioxide

5. Air type (1 Punkt)

We now know what dry air consists of. Humid air is different. Please identify the humid air in the following picture by clicking on the correct rectangle.



6. Avogadro's Law (1 Punkt)

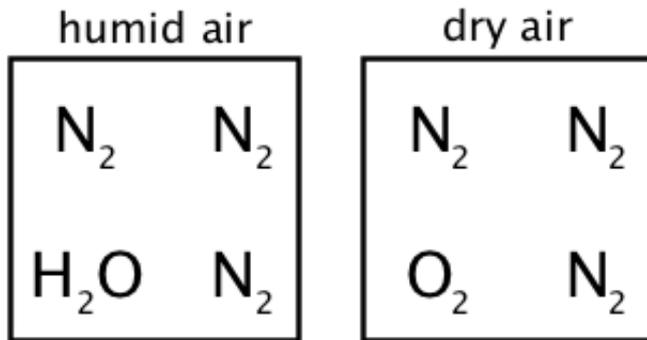
Air does not only consist of various elements, it is also important to know their state of aggregation: gas form. Looking at the behaviour gases in general it is important to repeat Avogadro's Law. It states that:

"At the same temperature and pressure ...

- of molecules
- have
- the same number
- of all gases
- equal volumes

7. Avogadro's Law - Application (1 Punkt)

The major difference between humid and dry air can be pictured like two containers that are filled like this:



According to Avogadro's Law, both of them contain the same number of molecules - in our case four. So dry and humid air do not differ in the amount of molecules but in their . In our example, you can find three molecules of nitrogen and one in dry air, whereas humid air has one . In order to find out which of these two containers is heavier, you have to compare their weight.

8. Weight of Molecules (1 Punkt)

Since different elements have different weights one can also calculate the weight of a single molecule. Refer to the [periodic system of elements](#) to get the correct weight for hydrogen and oxygen and associate the following statements correctly.

Auswählbare Terme

32 g/mol

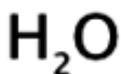
18 g/mol

Auswahl



passt zu

[Definition 1](#) 🔍



passt zu

[Definition 2](#) 🔍

9. One Mol (1 Punkt)

Strictly speaking "mol" is not a physical unit. Saying "a mol of (something)" refers to a certain amount (very much comparable to the word "dozen"). Which order of magnitude has 1 mol?

$(6.02 \times 10^{??})$

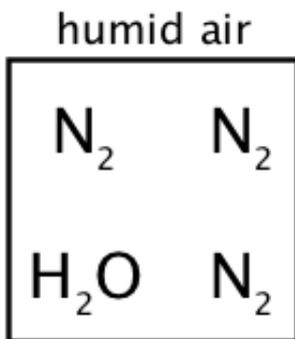
10. Mol Volume Water (1 Punkt)

You know the the weight of molecules and the amount of molecules within one mol. Have a quick guess: If you take 1 mol of Water, how much volume will you get approximately?

- 1 drop
- 1 handful
- 1 small cup

11. Condensation (1 Punkt)

When humid air contains enough water molecules condensation starts. Imagine that more water-molecules are inserted into this container with humid air and condensation has just started.



Which statement(s) is/are true?

- Pressure increases
- Pressure decreases
- Avogadro's Law is still applicable
- Avogadro's Law is no longer applicable

12. Daily Life Comparison (1 Punkt)

Let's try to apply your new understanding of the difference between humid and dry air by referring to something you know from your daily life. Please finish the following sentence correctly:

Humid air is comparable to dry air like...

- a wet t-shirt is comparable to a dry t-shirt (both t-shirts of the same size and original weight)
- a grapes & nut chcoloate is comparable to a nut chocolate (both chocolates of the same sitze and original weight)