

Difference Between Acid Anhydride and Basic Anhydride

www.differencebetween.com

Key Difference - Acid Anhydride vs Basic Anhydride

An anhydride is a chemical [compound](#) obtained with the elimination of a water compound from a parent compound. There are organic anhydrides and inorganic anhydrides classified based on the presence of C and H atoms. These anhydrides can be either acid anhydrides or basic anhydrides. Most of the [oxides](#) formed by the removal of water from an [acid](#) are known as an acid anhydride. Basic or base anhydrides are the compounds formed by the removal of water from a base. The **key difference** between acid anhydrides and base anhydrides is that **acid anhydrides are formed from acids whereas basic anhydrides are formed from bases.**

What is Acid Anhydride?

Acid anhydrides are chemical compounds known as oxides that are formed by the removal of water from an acid. An acid is a chemical compound that can donate H⁺ ions ([protons](#)) to a medium. But when an acid is converted to an anhydride, it can no longer release H⁺ ions. An acid anhydride is essentially composed of two acyl groups bonded to the same oxygen atom (-C(=O)-O-C(=O)). Acidic oxides are often known as acid anhydrides.

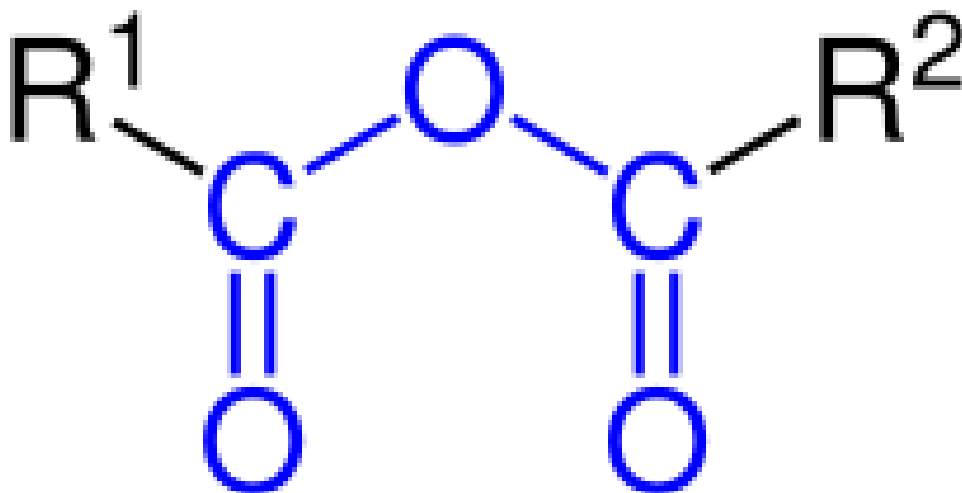


Figure 01: An Acid anhydride has two acyl groups bonded to one oxygen atom (given in blue).

The most common class of acid anhydrides is organic acid anhydrides. These are essentially [organic compounds](#). One of the most important organic acid anhydrides is a carboxylic anhydride. There are inorganic acid anhydrides as well. These are essentially inorganic compounds and do not contain any organic moiety. For example, CO₂ ([carbon dioxide](#)) is an acid anhydride derived from a carbonic acid (H₂CO₃). Some other examples are given below.

- Organic acid anhydrides
 - Acetic anhydride (the simplest organic acid anhydride)
 - Maleic anhydride
 - ATP in its protonated form
 - Acetic, formic anhydride
- Inorganic acid anhydrides
 - Silicon dioxide (SiO₂)
 - Vanadium pentoxide (V₂O₅)
 - Sulfur trioxide (SO₃)
 - Chromium trioxide (Cr₂O₃)

There are different ways of producing acid anhydrides. Acid anhydrides are composed of highly reactive acyl groups. The reactivity resembles that of acyl halides. However, acid anhydrides tend to be less electrophilic than acyl halides.

What is Basic Anhydride?

A basic anhydride or base anhydride is a metal oxide that forms a basic solution when reacting with water. This metal oxide, most of the times is either an [alkali metal](#) oxide or alkaline earth metal oxide (oxides of group 1 or group 2 elements).



Figure 02: Magnesium Oxide Powder, which is a Basic Anhydride.

These basic anhydrides are formed by removing water from the corresponding [hydroxide](#). For example, the basic anhydride Na_2O is formed from its basic hydroxide, NaOH . Some examples for basic anhydrides are given below.

- [Sodium oxide](#) (Na_2O)
- Potassium oxide (K_2O)
- [Magnesium oxide](#) (MgO)
- Calcium oxide (CaO)
- Barium oxide (BaO)

What are the Similarities Between Acid Anhydride Basic Anhydride?

- Both Acid Anhydride and Basic Anhydride are formed by the removal of water from a chemical compound.
- Both Acid Anhydride and Basic Anhydride can be converted into the hydride form by adding water.

What is the Difference Between Acid Anhydride Basic Anhydride?

Acid Anhydride vs Basic Anhydride	
Acid anhydrides are chemical compounds known as oxides that are formed by the removal of water from an acid.	A basic anhydride or base anhydride is a metal oxide that forms a basic solution when reacted with water.
Parent Molecule	
Acid anhydride is formed from an acid.	Basic anhydride is formed from a base.
Acidity	
Acid anhydrides are acidic compounds.	Basic anhydrides are basic compounds.
Examples	
There are some organic acid anhydrides such as acetic anhydride and some inorganic acid anhydrides such as sulfur trioxide.	Some examples of inorganic acid anhydrides include alkali metal oxides such as sodium oxide and alkaline earth metal oxides such as calcium oxide.

Summary - Acid Anhydride vs Basic Anhydride

Anhydrides are compounds formed by removal of water from another compound. There are two types; acid anhydrides and basic anhydrides. The difference between acid anhydrides and base anhydrides is that acid anhydrides are formed from acids whereas basic anhydrides are formed from bases.

Reference:

- 1.The Editors of Encyclopædia Britannica. "Anhydride." *Encyclopædia Britannica*, Encyclopædia Britannica, inc., 17 Dec. 2015. [Available here](#)
- 2.Helmenstine, Anne Marie, D. "Definition of Basic or Base Anhydride." ThoughtCo, Jun. 23, 2014. [Available here](#)
- 3."Organic acid anhydride." *Wikipedia*, Wikimedia Foundation, 10 Feb. 2018. [Available here](#)

Image Courtesy:

- 1.'FunktionelleGruppen Carbonsäureanhydrid'By MaChe (talk) - Own work, (Public Domain) via [Commons Wikimedia](#)
- 2.'Magnesium oxide'By No machine-readable author provided. (Public Domain) via [Commons Wikimedia](#)

How to Cite this Article?

APA: Difference Between Acid Anhydride and Basic Anhydride.(2018 February 14). Retrieved (date), from <http://differencebetween.com/difference-between-acid-anhydride-and-vs-basic-anhydride/>

MLA: "Difference Between Acid Anhydride and Basic Anhydride" Difference Between.Com. 14 February 2018. Web.

Chicago: "Difference Between Acid Anhydride and Basic Anhydride." Difference Between.Com. <http://differencebetween.com/difference-between-acid-anhydride-and-vs-basic-anhydride/> accessed (accessed [date]).



Copyright © 2010-2018 Difference Between. All rights reserved