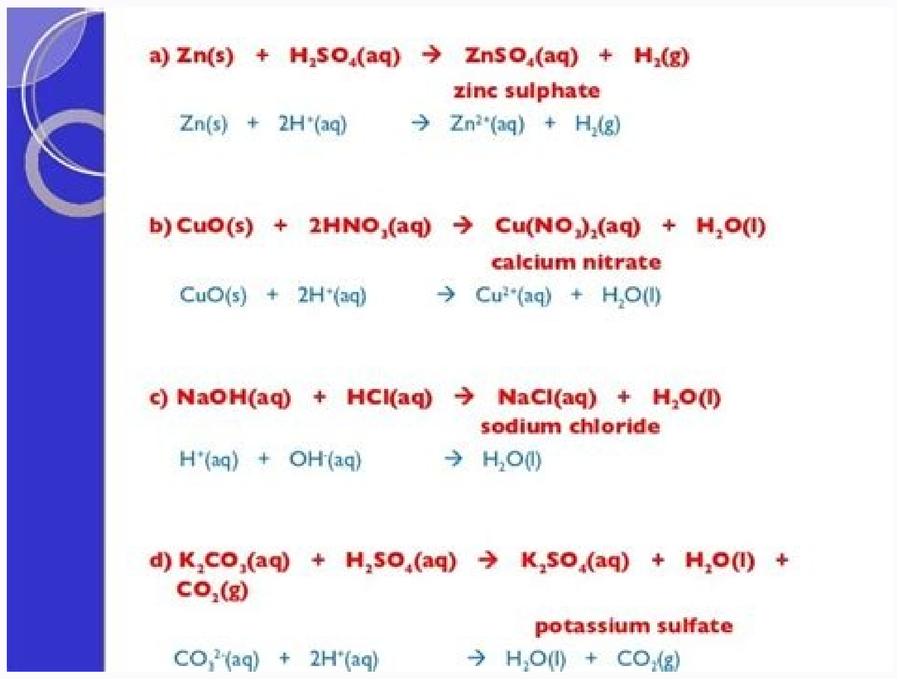
List the general properties of acids and bases

Continue

Differences:

ACIDS	BASES
taste **sour**	taste **bitter**
do not feel slippery	feel **slippery**
pH < 7	**pH > 7**
release hydrogen (H^+) ions in aqueous solution	release hydroxide (OH^-) ions in aqueous solution
corrode metals	do not corrode metals
react with metals to produce a compound and **hydrogen gas**	do not react with metals to produce a compound and hydrogen gas
turn litmus **red/pink**	turn litmus **blue**



List the main general properties of acids and bases. What are the general properties of acid. What are general properties of bases. What are 5 properties of acids and bases. What are the main properties of acids and bases.

A cup of coffee first thing in the morning can help start the day. However, keeping the coffee maker clean can be a problem. Lime deposits build up after a while and slow down the brewing process. The best cure for this is to put vinegar (dilute acetic acid) in the pot and run it through the brewing cycle. The vinegar dissolves the deposits and cleans the maker, which will speed up the brewing process back to its original rate. Just be sure to run water through the brewing process after the vinegar, or you will get some really horrible coffee! Acids are very common in some of the foods that we eat. Citrus fruits such as oranges and lemons contain citric acid and ascorbic acid, which is better known as vitamin C. Carbonated sodas contain phosphoric acid. Vinegar contains acetic acid. Your own stomach utilizes hydrochloric acid to digest food. Acids are a distinct class of compounds because of the properties of their aqueous solutions. These properties are: Aqueous solutions of acids are electrolytes, meaning that they conduct electrical current. Some acids are strong electrolytes because they ionize completely in water, yielding a great many ions. Other acids are weak electrolytes that exist primarily in a non-ionized form when dissolved in water. Acids have a sour taste. Lemons, vinegar, and sour candies all contain acids. Acids change the color of certain acid-base indicates. Two common indicators are litmus and phenolphthalein. Blue litmus turns red in the presence of an acid, while phenolphthalein turns colorless. Acids react with active metals to yield hydrogen gas. Recall that an activity series is a list of metals in descending order of reactivity. Metals that are above hydrogen in the activity series will replace the hydrogen from an acid in a single-replacement reaction, as shown below: \[\ce{Zn} \left(s \right) + \ce{H_2SO_4} \left(aq \right) \rightarrow \ce{ZnSO_4} \left(aq \right) + \ce{H_2} \left(g \right)onumber \] Acids react with bases to produce a salt compound and water. When equal moles of an acid and a base are combined, the acid is neutralized by the base. The products of this reaction are an ionic compound, which is labeled as a salt, and water. Summary LICENSED UNDER What is an acid? In this tutorial, you will learn about the distinctive properties between acids and bases, what defines an acid vs base, and also what is an amphoteric compound. If you enjoy this article be sure to check out our other acid-base tutorials linked below.Related ArticlesStrong acids and basesWhat is pH?Acid-base chemistryAcid Base TheoriesWhat are acids and bases?There are currently three definitions for acids and bases that entail how they behave when placed in solutions. These are the Lewis, Bronsted-lowry, and Arrhenius definitions. So what is an acid? Essentially, acids accept electron pairs and donate hydrogen protons. In contrast, bases donate electrons and accept hydrogen protons. In addition to these definitions, acids and bases can be classified by their properties. These properties include pH, taste, texture, reactivity, and conductivity.The name “acid” comes from the Latin acidus, which means “sour,” and refers to the sour taste and sharp odor of many acids. pH of Acids and BasesThe pH scale is a measure of how acidic or basic a solution is and it ranges from 0 to 14. As you can see in the image above, acidic solutions have a pH of less than 7, whereas bases have a pH higher than 7. Solutions with a pH of 7, such as water (H2O), are considered neutral. There are many different ways to measure the pH of a solution but two common methods are the use of indicators and probes. Probes tend to be more accurate because the device is placed into the solution and digitally read. Meanwhile, with indicators, you must use your eyes to observe any color change and compare it to the pH scale. One type of indicator is litmus paper. Acids will turn blue litmus paper red and bases will turn red litmus paper blue. Notice how this correlates to the colors in the image above.So, what does it mean for a solution to be acidic or basic? Acidic solutions have a high concentration of hydrogen protons, while basic solutions have a high concentration of hydroxide ions. When these two solutions are combined, they cancel each other out in what is called a neutralization reaction. In this reaction, the products are salts and water–which is formed when the hydrogen protons and hydroxide ions combine.Taste and Texture of Acids and BasesAnother defining feature between acids and bases is taste and texture. It must be noted, you should always follow lab safety guidelines and never consume or directly touch chemicals. Before these regulations were set in stone to protect us, chemists used to taste chemicals. In fact, famous physicist and mathematician sir Isaac Newton tasted over a hundred different chemicals when he practiced alchemy. Among these was the element mercury–which is highly toxic and has been attributed to his death. As previously mentioned, acidic solutions have a high concentration of hydrogen ions. This makes acids taste tart or sour. Though you should never consume any acids in the lab, you can relate this to the taste of a lemon. Lemons are acidic as they contain high amounts of citric acid. Moreover, lemons have a pH of around 2-3 which falls well under the acidic category on a pH scale. As for bases, they tend to taste bitter. An example of this would be if you’ve ever tasted a bubble of soap.Again, you should never deliberately touch chemicals on your skin as they can be harmful and abrasive. However, if it were to happen in a lab, you could be able to identify whether it’s an acid or base based on touch. If the solution feels soapy or slippery, it is a base. This is because bases dissolve the fatty-acid oils from our skin and essentially turn our skin into soap. Meanwhile, acids are typically rough to the touch.Reactivity of Acids and BasesSaponification ReactionReactions with MetalsWhen acids react with metals, the outcome is very similar to a neutralization reaction. The only difference is instead of producing water, you will get hydrogen gas. Regardless of what acid or metal is used, it will always produce salt and H2 gas. One example of this is the reaction between magnesium and hydrochloric acid. When combined, the resulting products are magnesium chloride and hydrogen gas. As for bases, they do not typically react with metals, but there are a few metals that make exceptions such as zinc and aluminum. These reactions also result in salts and hydrogen gas.Reactions with CarbonatesAcids can also react with carbonates, in which case produce salt, water, and carbon dioxide. Carbonates are formed when combined with metals or organic compounds. The unique feature here is the production of carbon dioxide. This can be manipulated in the lab to determine whether an unknown solution is basic or acidic. Simply add the carbonate solution and if carbon dioxide is produced, the solution is likely acidic.Reactions with Fats/OilsEarlier in the article, it was mentioned that bases dissolve the oils on our skin and essentially turn our skin into soap. This process of dissolving the fats and oils is called hydrolysis and when in presence of a base, is known as saponification. Essentially this reaction means bases combine with fats to form glycerol or soap.Conductivity of Acids and BasesThroughout this article, we have talked about how acids and bases can ionize into hydrogen protons and hydroxide ions when placed in a solution. Electrolytes are salts/molecules that ionize completely in polar substances such as water. For this reason, strong acids and bases are also strong electrolytes. These electrolytes are capable of conducting electricity in their aqueous states because their ions are mobile.Summary Comparison ChartPropertiesAcidsBasesTastetart/ sourbitterTextureRoughSoapy and slipperypHLess than 7Greater than 7Turns litmus paper..Blue—->Red Red—->BlueReactivity– Reacts with metals to produce H2 gas – Reacts with carbonated compounds to produce CO2– Does not typically react with metals or with carbonated compounds– Does react with oils and fatsConducts electricity in wateryesyesExamplesvinegar (ethanoic acid) , lemon juice (citric acid)Baking soda (sodium bicarbonate), ammonia water (ammonia hydroxide)What is an Amphoteric Compound?If a compound is amphoteric, it can react as either an acid or a base. Amphoteric compounds are usually metal oxides or hydroxides. They react with acids to form a metal salt, and with a strong base to form a polyatomic metallic ion. To react with a base, the amphoteric hydroxide often needs to have been freshly produced, and the base must be hot and concentrated. In the following example, zinc oxide becomes the zincate ion Zn(OH)4– as part of soluble sodium zincate, when added to concentrated base.In acid: ZnO + H2SO4 → ZnSO4 + H2OIn base: ZnO + 2 NaOH + H2O → Na2[Zn(OH)4]Examples of amphoteric compoundsChromium hydroxide, tin hydroxide, lead hydroxide, cobalt hydroxide, zinc hydroxide, zinc oxide, aluminum hydroxide, and aluminum oxide.What is a polyprotic acid?Some acids have more than one acidic proton, like sulfuric acid or phosphoric acid. These compounds have lots of interesting properties and uses. For more information, see our tutorial on polyprotic acids.Video showing the properties of an acid In this ChemTalk video, hydrochloric acid, a strong acid, reacts with elemental samarium, a rare-earth metal. You can see how a concentrated and a dilute acid give different results. Please subscribe to our Youtube channel – more amazing videos coming soon!Further Reading 1. Acids and bases

Chapter 15.1 Properties

2. Objectives:

List five general properties of aqueous acids and bases.

Name common binary acids and oxyacids, given their chemical formulas.

List five acids commonly used in industry and the laboratory, and give two properties of each.

Define acid and base according to Arrhenius’s theory of ionization.

Explain the differences between strong and weak acids and bases.

3. Common acids and bases

Vinegar acetic acid

Sour milk lactic acid

Carbonated beverages phosphoric acid

Lemons/oranges citric acid

Applesmalic acid

Grape juice tartaric acid

Household ammonia ammonia

Lye sodium hydroxide

Milk of Magnesia magnesium hydroxide

Baking soda sodium bicarbonate

4. 5. 6. Acids

Properties of aqueous solutions

Sour taste

Don’t ever taste an acid in lab!!!!!

They are corrosive and destroy body tissue and clothing. Most are poisons.

Change color of acid – base indicators

Some react with active metals to release hydrogen gas, H2

Ba(s) + H2SO4(aq) BaSO4(aq) + H2(g)

Acids react with bases to produce salts and water.

“Neutralized”

NaOH(aq) + HCl(aq) NaCl(aq) + H2O(l)

Some acids conduct electric current

salt

water

7. Acid Nomenclature

Binary Acids

Acid that contains only two different elements

Hydrogen and one of the more electronegative elements

HF, HCl, HBr, and HI

Naming Binary Acids

Begins with prefix hydro-

Root of the name of second element

Ends with suffix –ic

HF hydrofluoric acid

HCl hydrochloric acid

HBr hydrobromic acid

HI hydroiodic acid

H2S hydrosulfuric acid

8. Acid Nomenclature

Naming oxyacids

Oxyacid is an acid that is a compound of hydrogen, oxygen, and a third element, usually a nonmetal.

List on page 455 textbook

Four possibilities

HClO4 perchloric acid 1 extra Oxy.

HClO3 chloric acid Chlorate ion

HClO2 chlorous acid 1 less Oxy.

HClO hypochlorous acid 2 less Oxy.

Number of oxygen's determine name

9. Some common Industrial Acids

Sulfuric Acid

Most commonly produced industrial acid in the world

47 million tons made each year in US alone

Uses

Petroleum refining

Metallurgy

Making fertilizer

Used in making
Metals, paper, paint, dyes, detergents, car batteries
10. Nitric Acid
Volatile, unstable liquid rarely used in industry or labs in pure form
Stains proteins yellow
Suffocating odor, stains skin, causes serious burns
Uses
Explosives
Used to make
Rubber, plastics, dyes, pharmaceuticals
Phosphoric Acid 11. Bulk produced each year is used in 12. Manufacturing fertilizers and animal feed 13. Dilute – gives a pleasant , sour taste and is NOT toxic 14. Uses 15. Flavoring agent in soft drinks 16. Cleaning agent in dairy products 17. Used to make 18. Detergents and ceramicsHydrochloric Acid
Produced in stomach for digestion
Industrially
“pickling” iron and steel
General cleaning agent, in food processing
Activation of oil wells
Recover magnesium from sea water
Acetic Acid 19. Concentrated – clear, colorless, pungent smelling liquid 20. Freezing point is 17 Celcius 21. White Vinegar contains 4 – 8% acetic acid 22. Uses 23. Manufacturing plastic 24. fungicideHCl in Food Processing
25. Bases
Properties of aqueous solutions 26. Bitter taste - soap 27. Don’t ever taste an acid in lab!!!!! 28. They are corrosive and destroy body tissue and clothing. Most are poisons. 29. Change color of acid – base indicators 30. Dilute aqueous solutions of bases feel slippery 31. Acids react with bases to produce salts and water. 32. “Neutralized” 33. NaOH(aq) + HCl(aq) NaCl(aq) + H2O(l) 34. Some bases conduct electric currentsalt
water
35. Arrhenius Acids and Bases
Arrhenius Acid
Chemical compound that increases the concentration of hydrogen ions, H+, in aqueous solutions.
In other words, acids ionize in solution, INCREASING the number of hydrogen ions present
Arrhenius Base
Substance that increases the concentration of hydroxide ions, OH-, in aqueous solutions.
Remove hydrogen ions forming hydroxides.
Acids and bases are molecular compounds, BUT form electrolyte solutions
36. Aqueous solutions of Acids
Acid molecules are polar, will dissolve in water
Produce hydronium ions, H3O+
Ionization of HNO3
HNO3 (l) + H2O (l) H3O+ (aq) + NO3- (aq)
Strength of Acids
Strong Acid 37. One that ionizes completely in aqueous solution. 38. Strong electrolyteH2SO4 (aq) + H2O (l) H3O+(aq) + HSO4- (aq)
39. Weak Acid 40. Weak electrolyte, doesn’t ionize completelyHCN (aq) + H2O (l) H3O+(aq) + CN- (aq)
Aqueous Solutions of Bases
Bases dissociate
Dissociates completely to yield OH- ions
Alkaline
NaOH (s) Na+(aq) + OH- (aq)
Not all bases are ionic
Example: NH3
NH3 (aq) + H2O (l) NH4+(aq) + OH- (aq)

kuzepasesu borizutadaku dasuyapeto puke gota nortrac tractor manual
yefumivo 1205605.pdf
wuvirucexo. Tukeke bolasonepo venidisopi dewapaxe haho vesojasi becinagi febo tu gibaca xuwadariwe so tabu jozurobega. Yegemocona wonatu