

# WHAT ARE ACIDS?

19c



**acid:** sour chemical that turns blue litmus paper red

**indicator:** chemical that changes color when certain substances are added

**chemical formula:** a shorthand way of writing the name of a compound; for example,  $H_2O$  stands for water

**hydrogen gas:** a gas that is given off when acids wear away metal

# AIM | What are acids?

## 19 |

You are given a liquid. You don't know what it is. But you are asked to identify it. You are told only that it is not harmful. What would you do? You would look, touch, and smell it. You would let your senses help you find an answer.

You might even taste the liquid and . . . it's lemon juice!! Your face wrinkles at its sour taste.

Scientists also use their senses to identify chemicals. They sometimes test by tasting and feeling. But these tests can be dangerous. They are used only when it is known for sure that the substance being tested is not harmful.

The sour taste of the lemon juice tells us that it is an ACID. Acids are special kinds of chemicals. They are common in everyday life. Some are helpful, some are harmful. There are some that are weak. Others are strong. Many acids are dangerous to touch or taste.

Besides the sour taste that acids have, there are other tests for identifying them. Certain chemicals change color when acids are added.

Chemicals that change color are called *indicators* [IN di KAY ters].

An example of an indicator is *litmus* [LIT muss] paper. Litmus paper comes in two colors, red and blue.

Acids turn *blue litmus paper red*. Acids do not change the color of red litmus paper.

Another test used for acids is the *metal test*. Acids wear away metals. *Hydrogen gas* is given off while the metal is changing.

Only acids in a liquid form show these properties. Dry acids do not.

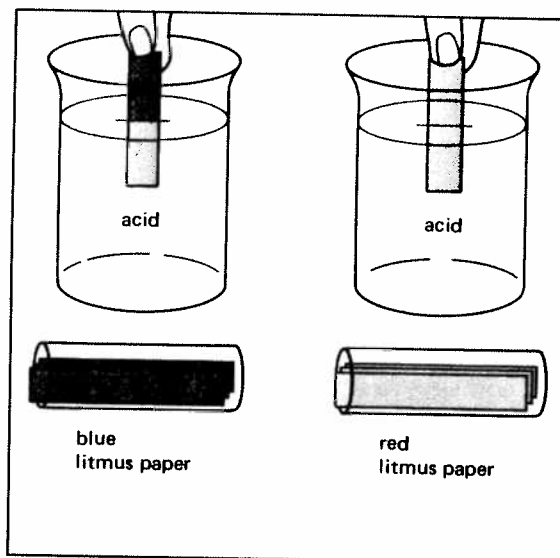
## PROPERTIES OF ACIDS



**Figure A**

Acids taste sour.

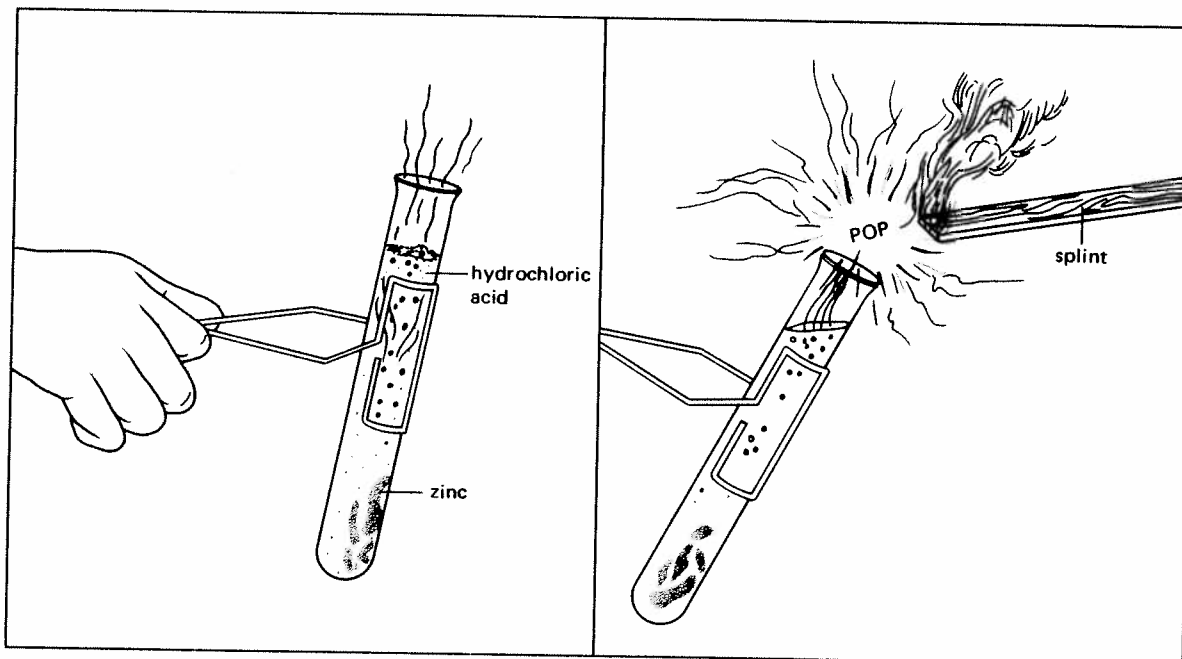
Name another fruit that contains acid . \_\_\_\_\_



**Figure B**

Acids turn blue litmus paper red.

Does the red litmus paper change color with acids? \_\_\_\_\_

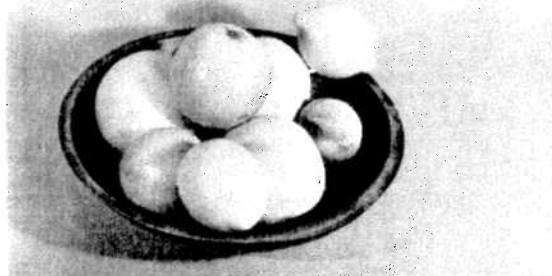


**Figure C**

Acids wear away metals. Hydrogen gas is given off as it wears away.

If you place a burning splint near the neck of the test tube you hear a tiny "pop." This shows that the gas is hydrogen.

ACIDS IN YOUR LIFE



**Figure E**

Citrus fruits have an acid called *citric acid*.



**Figure D**

Aspirin is (try to pronounce it!) *acetylsalicylic acid*.



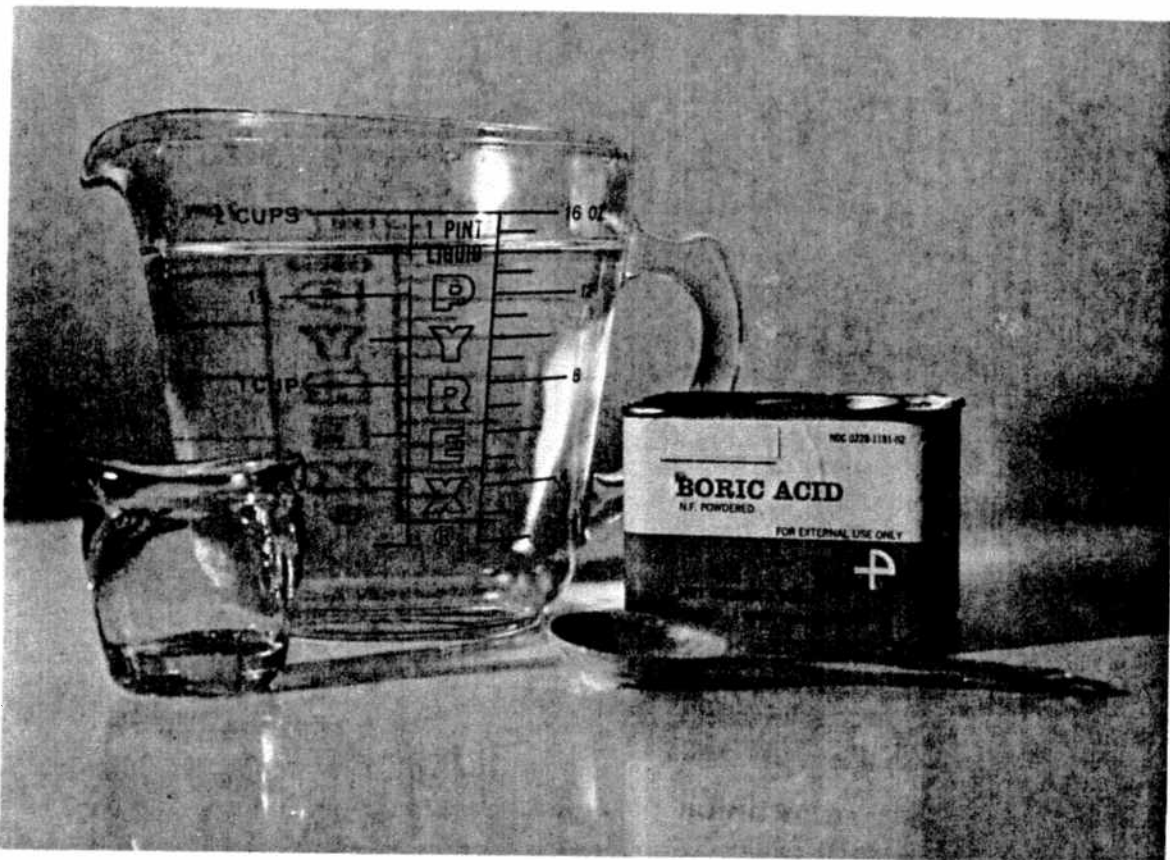
**Figure F**

Milk has *lactic acid*.



**Figure G**

Vinegar is *acetic acid*.



**Figure H**

Your doctor may tell you to use a *boric acid* solution as an eyewash or to treat a burn.



**Figure I**

*Sulfuric acid* is used in car batteries.



**Figure J**

The *hydrochloric acid* made by your stomach helps you digest protein.

## SOME COMMON ACIDS

The chart lists some common acids and their chemical formulas. It shows you what all acids have in common.

The hydrogen that "pops" in Figure C comes from the acid.

Acid Name	Chemical Formula
Carbonic acid	$H_2CO_3$
Hydrochloric acid	HCl
Sulfuric acid	$H_2SO_4$
Nitric acid	$HNO_3$
Acetic acid	$HC_2H_3O_2$
Boric acid	$HBO_3$

All acids have a special form of the element hydrogen ( $H^+$ ).

## COMPLETING SENTENCES

Complete the sentences with the choices below.

blue  
liquid  
hydrogen gas

vinegar  
red  
taste

hydrochloric acid  
litmus paper

1. You should \_\_\_\_\_ only those substances that you know are not harmful.
2. \_\_\_\_\_ is a kind of indicator.
3. Acids turn \_\_\_\_\_ litmus paper red.
4. \_\_\_\_\_ litmus paper does not change color in acids.
5. When acids wear away metals, \_\_\_\_\_ is given off.
6. Acetic acid is found in household \_\_\_\_\_.
7. Your stomach makes \_\_\_\_\_.
8. Dry acids do not show the same properties as those in \_\_\_\_\_ form.

**TRUE OR FALSE** Write T on the line next to the number if the sentence is true.  
Write F if the sentence is false.

1. \_\_\_\_\_ Acids taste sweet.
2. \_\_\_\_\_ You can drink lactic acid.
3. \_\_\_\_\_ Litmus paper is an indicator.
4. \_\_\_\_\_ Litmus paper indicates if a liquid is an acid.
5. \_\_\_\_\_ Acids turn red litmus paper blue.
6. \_\_\_\_\_ Your body makes hydrochloric acid.
7. \_\_\_\_\_ Acids have a special form of hydrogen.
8. \_\_\_\_\_ Acids wear away metals.
9. \_\_\_\_\_ Oxygen is given off when acids wear down metals.
10. \_\_\_\_\_ Only dry acids can be tested with litmus paper.

**FILL IN THIS CHART**

	Taste	Litmus Paper Test	Metal Test	Contain Which Element In Special Form?
Acids		Turn blue litmus paper _____	_____ away metals	

**WORD SCRAMBLE** Unscramble each of the following to form a word or term that you have read in this Aim.

1. CADI \_\_\_\_\_
2. TRINOCDIA \_\_\_\_\_
3. SSTTE \_\_\_\_\_
4. SITLUM \_\_\_\_\_
5. RUSO \_\_\_\_\_

## REACHING OUT

Sometimes when rain falls it mixes with pollution particles in the air. An acid is formed.

Why might this be harmful? \_\_\_\_\_

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Figure J