

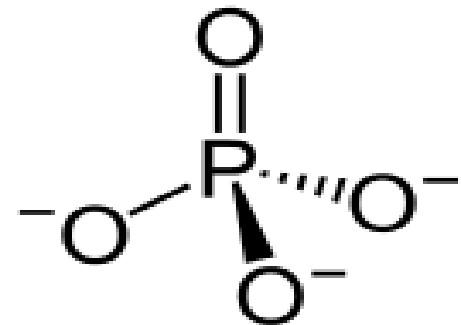
Estimation of inorganic phosphate in soft drink



Phosphate in food

Phosphate occurs **naturally** in the form of organic esters in many kinds of food, including meat, potatoes, bread, and milk.

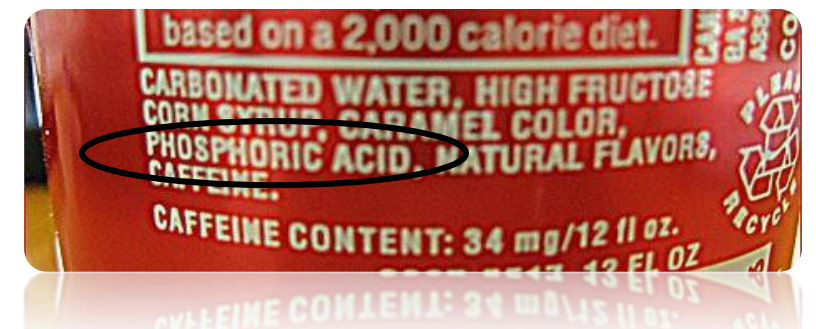
Phosphate also **used as a food additive** (inorganic phosphate) as a preservative, a flavor or color enhancer, extend shelf life, and retain moisture.



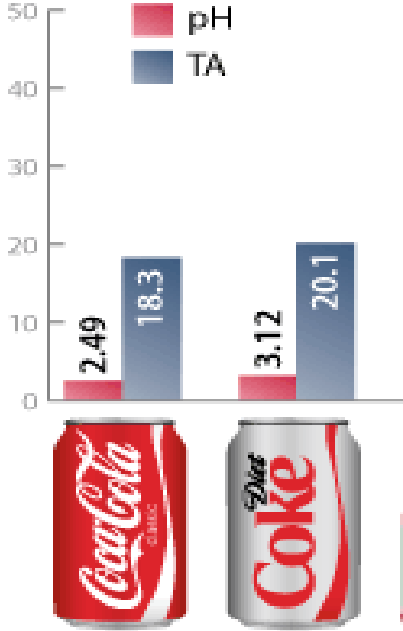
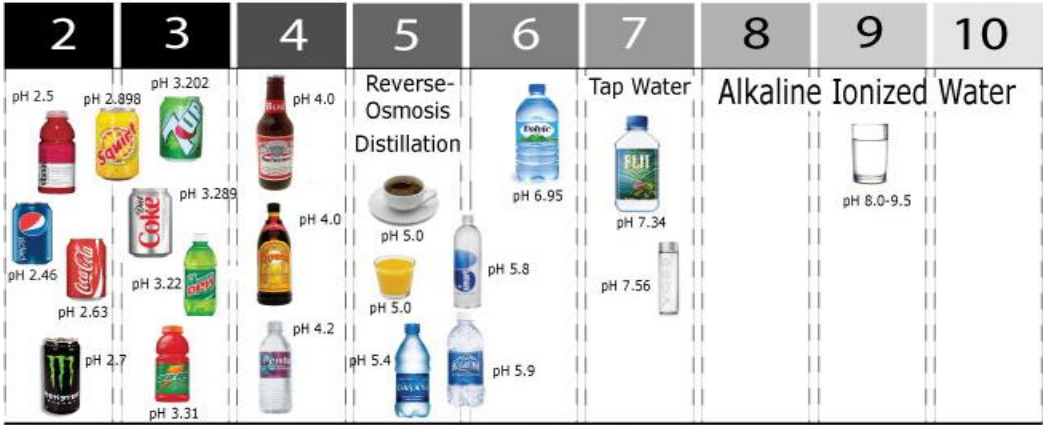
Soft drinks are complex mixtures containing a variety of substances such as coloring compounds, flavoring agents, acidifiers, sweeteners, preservatives, and caffeine.

The most common **acidifier** used in soft drinks is **phosphoric** which gives a tangy taste in the mouth.

Phosphoric acid can also act as a **preservative**, keeping the contents of the bottle fresh.

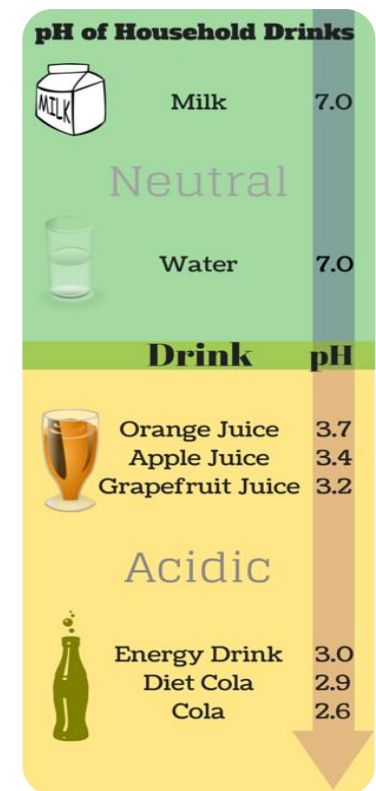


Due to the use of phosphoric acid, **cola is a actually more acid than vinegar** which no body can drink straight. But a ton of sugar, dyes and flavoring are added to mask the acidity.



objective

Estimation of organic phosphate in soft drink.



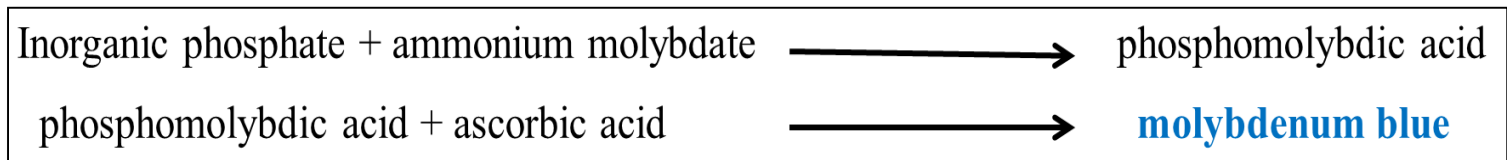
Principle:

Phosphoric acid is **colorless**, they cannot be directly determined using visible-light spectrophotometry.

Instead, we will quantitatively convert them into a colored substance, whose **absorbance can be easily measured**.

Inorganic phosphate reacts with ammonium molybdate in an **acid solution** (ammonium molybdate prepared in sulphuric acid in this experiment) to form phosphomolybdic acid.

Phosphomolybdic acid is then reduced by a reducing agent (3% ascorbic acid) to give **molybdenum blue** **a green/ blue color** but does not affect the uncombined molybdic acid.



Method

	Standard phosphate solution	Soft drink sample	Water	Ammonium molybdate	Ascorbic acid
Blank	----	----	2	0.5 ml	0.5 ml
3 ppm	2	----	---		
4.5 ppm	2	-----	---		
6 ppm	2	---	---		
12 ppm	2	---	---		
15 ppm	2	---	---		
SD	---	0.5	1.5		
SD	---	0.2	1.8		

Method

- Mix thoroughly after each addition .
- Allow to stand for 10 min. (a deep blue/green color should develop).
- Measure the absorbance at 650 nm.

concentration	Absorbance
3 ppm	
4.5 ppm	
6 ppm	
12 ppm	
15 ppm	
SD unknown	
SD unknown	

Results and Calculations:

- Plot a graph between absorbance and concentration of phosphate in various standard solutions and obtain the calibrated curve.
- From the curve determine the amount of phosphate in the test solution.

Calculations:

Inorganic phosphate concentration (ppm) = dilution factor x concentration.

* **Note:** Soft drink sample was diluted in the sample preparation (1:10)

[Two dilution factor]

