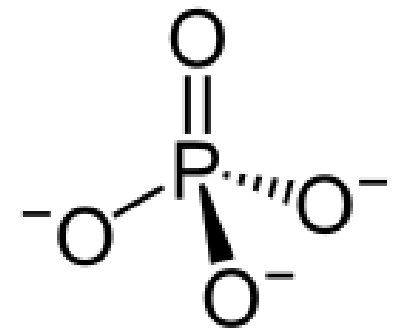


Estimation of inorganic phosphate in soft drinks

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.

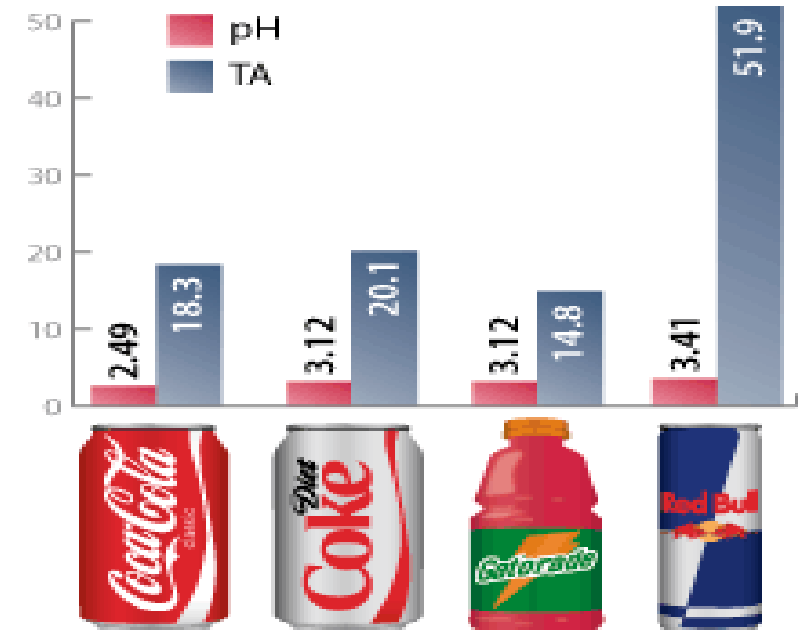
Soft drinks:

- Soft drinks are **complex mixtures** containing a variety of substances such as colouring 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 acts as a **preservative, keeping the contents of the bottle fresh.**



Cola vs Vinegar:

- Due to the use of phosphoric acid, cola is 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.



Practical Part

Objective:

- Estimation of inorganic phosphate in soft drinks using ascorbic acid as reducing agent.

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 sulphoric 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** that absorb at 650nm .

Method:

	Standard	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 (try different concentration)					

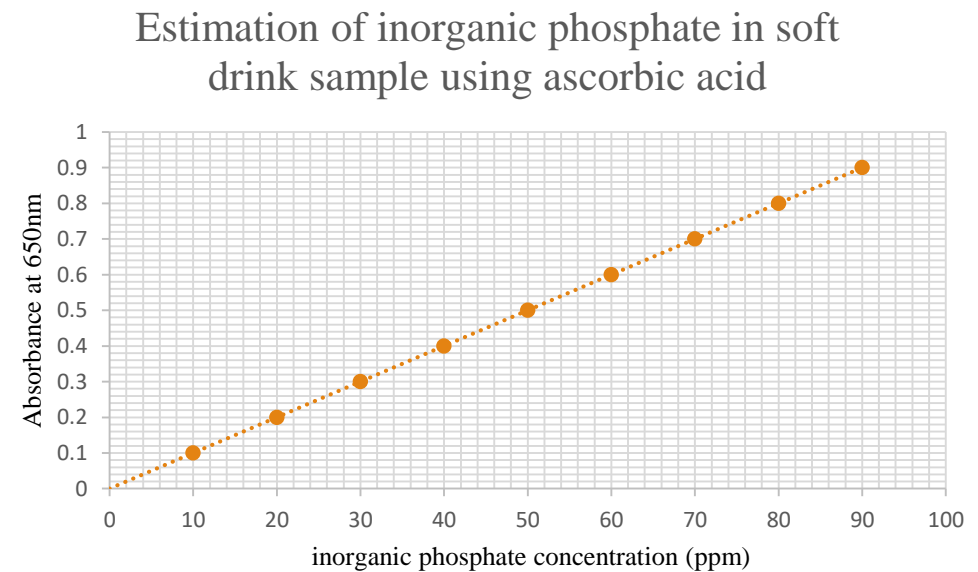
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Mix thoroughly after each addition → Allow to stand for 10 min
 (a deep blue/green colour should develop) → Measure the absorbance at 650 nm.

Results:

- 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.

Tube	Absorbance at 650nm
Blank	
3 ppm	
4.5 ppm	
6 ppm	
12 ppm	
15 ppm	
Sample	



Calculations:

- **Inorganic phosphate concentration**= dilution factor x concentration from the curve = ----- ppm

- **Dilution factor**= final volume / aliquot volume

→SD1=

→SD2=