

PW4 : HIGHLIGHTING THE CONSTITUENTS OF MILK, BREAD AND EGG

Material and products :

curdled milk	copper sulfate
bread	concentrated soda
egg	iodized water
glucose	2 beakers
calcium	1 funnel with filter paper
salt water	9 test tubes
Fehling liqueur	wooden clamp
ammonium oxalate	equipment for collecting milk, egg
silver nitrate	Pipettes

1) Separate the clot from the whey by filtration

Use the 2 beakers and the funnel with the filter paper.
 After filtering, put the clot back in the first beaker.
 The little one is liquid because it contains water.

2) Highlighting of reducing sugar

TUBE 1 (control) : 2 mL of glucose-containing water + Fehling Liqueur. Heat up.

TUBE 2: 2mL of whey + Fehling Liqueur. Heat up.

The Fehling test highlights the reducing sugars. When hot, the reagent gives a brick-red precipitate:
 the sugar tested is then a reducing sugar.

Milk contains a sugar : lactose.

Experiences	RESULTS	CONCLUSION
Glucosated water+ Fehling liqueur (witness)		
Whey + liqueur Fehling		

3) Calcium highlighting

TUBE 3: 2 mL of water + calcium + a few drops of ammonium oxalate (NH₄).

TUBE 4: 2mL of whey + a few drops of ammonium oxalate (NH₄).

Experience	RESULTS	CONCLUSION
Water + calcium + ammonium oxalate (witness)		
Whey + oxalate of ammonium		

Which constituent is highlighted thanks to the ammonium oxalate test ?

4) Detection of chlorides

TUBE 5: 2mL of salted water + a few drops of silver nitrate (AgNO₃).

TUBE 6: 2mL of whey + a few drops of silver nitrate (AgNO₃).

Experiences	RESULTS	CONCLUSION
Salt water + silver nitrate (witness)		
Whey + silver nitrate		

Which constituent is highlighted thanks to the silver nitrate test ?

5) Highlighting of the proteins by the Biuret reaction (NaOH + CuSO₄)

TUBE 7: 2mL of clot + a few drops of sodium hydroxide (NaOH) shake and then + a few drops of copper sulfate (CuSO₄), stir.

When a purple coloration is observed, the sample contains proteins.

EXPERIENCE	RESULT	CONCLUSION
Clot + soda + copper sulfate		

Note : When the whole milk is left to stand, a deposit of cream forms on the surface which is a lipid.

Conclusion :

6) Highlighting the constituents of bread

TUBE 8 : a little breadcrumbs and heat.

Experiment 9 : On half a slice of bread, place a few drops of iodized water.

Experiment 10 : on half a slice of bread, place a few drops of soda (NaOH) a few drops of copper sulfate (CuSO₄) (Biuret reaction)

Iodized water turns dark purple in the presence of slow sugar.

Results of experiments not carried out : the bread crumb is put in water and after filtration, the filtrate is analyzed with

- the Fehling test : a brick-red precipitate is obtained.
- ammonium oxalate : a white precipitate is obtained.
- silver nitrate : a white precipitate is obtained.

EXPERIENCES	RESULTS	CONCLUSION
Heated bread crumbs		
Bread + iodized water		
Bread + body reaction Biuret		
Filtrate + liqueur of Fehling	Brick red precipitate	
Filtrate + oxalate of ammonium	White precipitate	
Filtrate + silver nitrate	White precipitate	

Note : it contains a little lipids highlighted by rubbing the bread on paper.

Conclusion : What are the constituents of bread ? How do you qualify bread ?

7) Highlighting the constituents the egg

Experiment 11 : TUBE 9 : a little egg yolk + a few drops of soda (NaOH) stir and then + a few drops of copper sulfate (CuSO₄), stir.

Experiment 12 : Take a little egg yolk and rub it on a sheet of paper.

Results of unrealized experiments :

- the heated egg white gives off water vapor.
- the egg yolk + Biuret reagent gives a purple coloration.

Experiences	RESULTS	CONCLUSION
Egg white+ reaction of the Biuret		
Egg yolk rubbed on paper		
heated egg white	water vapor in the tube	
Egg yolk + reagent de Biuret	Purple coloring	

Conclusion : What are the constituents of the Egg ?

There are **simple foods** containing **only one category of molecules** : example: oil contains only lipids, sugar contains only carbohydrates.

General conclusion the foods studied :