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**LAB MANUAL**  
**SCIENCE**  
**FOR CLASS VI**

By  
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Nutan Vidya Mandir  
Dilshad Garden, Delhi

Name .....

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## EXPERIMENT 1

### AIM

*To test the presence of starch, protein and fats in the given sample of food.*

### MATERIALS REQUIRED

(i) Petri dish, (ii) Test tube, (iii) Dropper, (iv) Copper sulphate, (v) Caustic soda, (vi) Ground-nuts, (vii) Raw potato, (viii) Iodine solution, (ix) Milk.

### THEORY

We know that food is required for the growth of our body. Food gives us energy to work and play. It gives us resisting power against diseases. The main components of food are carbohydrates, proteins, fats, vitamins, minerals, fibre and water. Nutrients are the components of food that the body needs in adequate amount for growth, to reproduce, and to lead a normal healthy life.

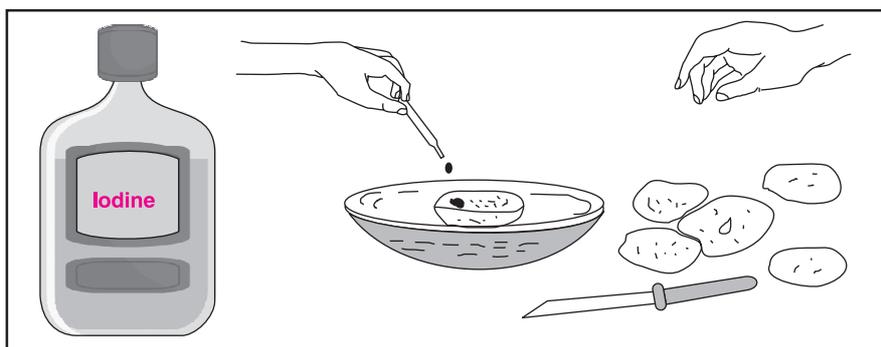
- Cellulose, starch, glucose and fructose are the important carbohydrates found in our food.
- Fats act as fuels in our body since they provide more energy than carbohydrates.
- Proteins are required for growth and repair of tissues in our body. They help in building new tissues.

#### (A) Test for Starch

### PROCEDURE

1. Take 2-3 small pieces of potato in a petri dish.
2. Put two to three drops of dilute solution of iodine on it.

### DIAGRAM



**Figure:** Test for starch.

### OBSERVATION

Colour of iodine solution turns into blue-black which indicates the presence of starch in potato.

## CONCLUSION

The food material (Potato) contains starch.

### (B) Test for Protein

## PROCEDURE

1. Take 10 ml of milk in a test tube.
2. Now add two drops of solution of copper sulphate and ten drops of solution of caustic soda to the milk in the test tube.

## OBSERVATION

Violet colour appears which indicates the presence of protein in the milk.

## CONCLUSION

The food material (milk) contains protein.

### (C) Test for Fat

## PROCEDURE

1. Take small amount of ground-nut.
2. Wrap it in a piece of paper and crush it.

## OBSERVATION

An oily patch on paper indicates the presence of fat in the ground-nut.

## CONCLUSION

The food material (ground-nut) contains fat.



## VIVA QUESTIONS

### Q. 1. What are nutrients ?

**Ans.** The components of food that are necessary for growth, maintenance and other living activities are called nutrients.

### Q. 2. Name the major nutrients present in our food.

**Ans.** Carbohydrates, proteins, fats, vitamins and minerals.

### Q. 3. Name the nutrients which mainly give energy to our body.

**Ans.** Fats and carbohydrates.

### Q. 4. Name two foods which contain fats.

**Ans.** Ground-nut, ghee.

### Q. 5. Name two foods which contain proteins.

**Ans.** Milk, pulses.

### Q. 6. Name the body building foods.

**Ans.** Foods that contain proteins are often called body building foods.

**Q. 7. If same amount of fat and carbohydrate is eaten, which will give more energy ?**

**Ans.** Fats give more energy as compared to same amount of carbohydrates.

**Q. 8. Name two foods which contain carbohydrates.**

**Ans.** Potato, rice.

**Q. 9. What are different types of proteins ?**

**Ans.** Globular proteins and fibrous proteins.

**Q. 10. Give one biological importance of proteins.**

**Ans.** They help in growth and repair of the body tissues.



## EXPERIMENT 2

### AIM

*To study the solubility of different substances in water.*

### MATERIALS REQUIRED

(i) Sugar, (ii) Salt, (iii) Chalk powder, (iv) Sand, (v) Washing soda, (vi) Beakers, (vii) Water, (viii) Glass rod.

### THEORY

Two components are miscible only when they have similar nature or belong to the same homologous series. Solubility depends upon the following factors.

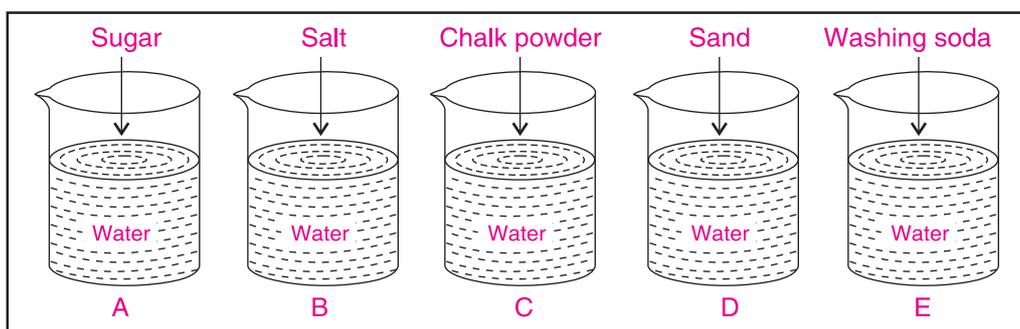
(i) Nature of solute (ii) Nature of solvent (iii) Temperature.

**Solute.** It is the small component in the binary solution.

**Solvent.** It is the component of the solution which is present in a large proportion.

### PROCEDURE

1. Take five beakers and label them as A, B, C, D, E.
2. Fill each one of them upto half with water.
3. Add small amount of sugar to beaker A, salt to beaker B, chalk powder to beaker C, sand to the beaker D, washing soda to the beaker E.
4. Stir the contents of each beaker with glass rod and observe the change in each beaker.

**DIAGRAM**

**Figure:** Solubility of different materials.

**OBSERVATION**

|          |   |
|----------|---|
| Beaker A | Sugar is soluble in water because sugar disappears completely in water. |
| Beaker B | Salt is soluble because it disappears completely in water.              |
| Beaker C | Chalk powder is insoluble, because it does not disappear in water.      |
| Beaker D | Sand is insoluble, because it does not disappear in water.              |
| Beaker E | Washing soda is soluble, because it disappears completely in water.     |

**CONCLUSION**

All substances do not dissolve and disappear while some electrolyte do.

**VIVA QUESTIONS**

**Q. 1. What are soluble substances ?**

**Ans.** The substances which completely disappeared in water are soluble.

**Q. 2. Name any two substances which are soluble in water.**

**Ans.** Salt and sugar.

**Q. 3. What are insoluble substances ?**

**Ans.** The substances which do not mix with water.

**Q. 4. Name any two substances which are insoluble in water.**

**Ans.** Sand and chalk powder.

**Q. 5. Why is water known as universal solvent ?**

**Ans.** Water is known as universal solvent because it can dissolve a large number of substances.

**Q. 6. What are transparent substances?**

**Ans.** The substances through which things can be seen are called transparent substances.

**Q. 7. Write the names of three liquids which are miscible in water.**

**Ans.** Milk, Glycerine and soft drinks.

**Q. 8. What is a solute ?**

**Ans.** It is the small component in the binary solution which is dissolve in solvent.

**Q. 9. What is solubility ?**

**Ans.** The maximum amount of a substance dissolved in a given volume of solvent is called solubility.

**Q. 10. Give the name of one solid organic compound which is dissolved in water ?**

**Ans.** Sugar.

**EXPERIMENT 3****AIM**

*To separate a mixture of sand and water by decantation and sedimentation method.*

**MATERIALS REQUIRED**

(i) Sand, (ii) Water, (iii) Beakers, (iv) Glass rod.

**THEORY**

Many substances around us contain only one type of constituent particle. These are called pure substances. Substances containing more than one type of constituent particles are called impure substances. Impure substances can be separated by different methods like hand picking, winnowing, sieving, magnetic separation, sedimentation, decantation, loading, filtration, evaporation, sublimation, distillation, churning.

- **Sedimentation.** It is the process of settling of heavy, solid particles in a mixture at the bottom of the vessel.
- **Decantation.** It is the transfer of pure liquid from one vessel to other vessel without disturbing the settled (sedimented) particles.

**PROCEDURE**

1. Put some sand and water in a beaker.
2. Stir the mixture with glass rod.
3. Allow the mixture undisturbed for sometime to settle.
4. Heavier sand particles settle at the bottom.
5. The clear water above is poured into the another beaker with the help of a glass rod [Fig. (a)]. In this process we donot disturb the settled particles (sediment).

**OBSERVATION**

Clear liquid which is transferred to another beaker is pure.

Sand particles which are heavy settle at the bottom are called sediments.

## CONCLUSION

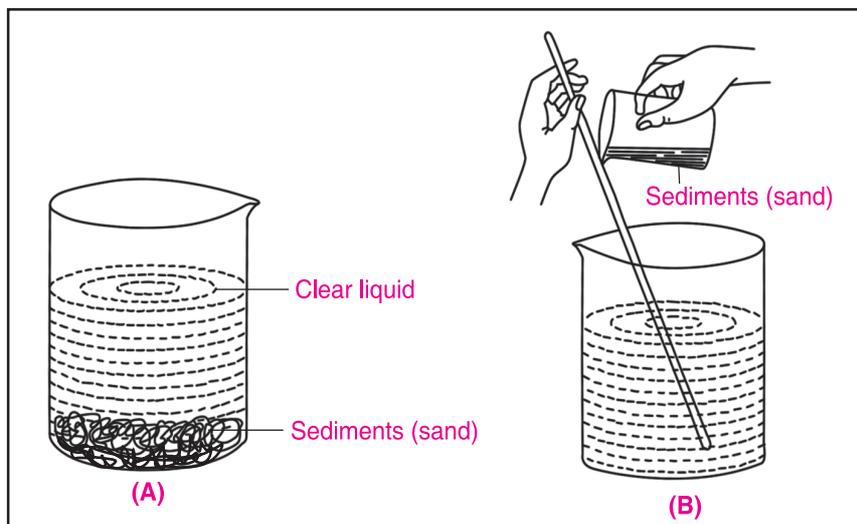


Figure: (a) Sedimentation and (b) Decantation.

## CONCLUSION

The mixture of sand and water can be separated by sedimentation and decantation.



## VIVA QUESTIONS

**Q. 1. What are sediments ?**

**Ans.** The heavy components which settle at the bottom of the beaker are known as sediments.

**Q. 2. What is decantation ?**

**Ans.** It is a process to remove water from a mixture.

**Q. 3. Which method is used to separate water from mixture of water and oil ?**

**Ans.** Decantation method.

**Q. 4. What are immiscible liquids ?**

**Ans.** When two liquids do not mix and form two separate layers.

**Q. 5. Give one example of immiscible liquid.**

**Ans.** Mixture of water and oil is immiscible liquid.

**Q. 6. What is sedimentation ?**

**Ans.** It is the process of settling down of heavy solid particles in a mixture at the bottom of the vessel.

**Q. 7. What is a mixture ?**

**Ans.** A mixture is the combination of two or more substances in any ratio.

**Q. 8. What do you mean by impure substances ?**

**Ans.** They contain more than one type of particles combined in any ratio.



## EXPERIMENT 4

### AIM

*To study the solubility of some given liquids in water.*

### MATERIALS REQUIRED

(i) Vinegar, (ii) Lemon juice, (iii) Mustard oil, (iv) Coconut oil, (v) Beakers, (vi) Water, (vii) Glass rod.

### THEORY

The two components are not completely soluble. They are miscible only when they have similar nature or belong to the same homologous series. Solubility depends upon the following factors.

(i) Nature of solute (ii) Nature of solvent (iii) Temperature.

**Solute.** It is the small component in the binary solution.

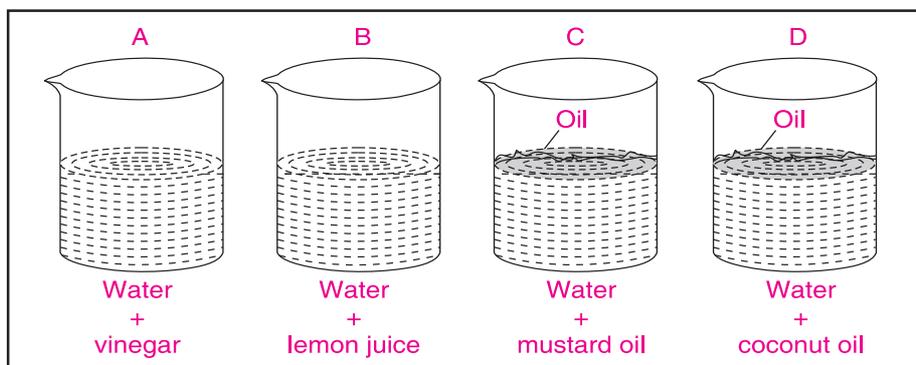
**Solvent.** It is the component of the solution which is present in a large proportion.

### PROCEDURE

1. Take four beakers and mark them as A, B, C, D.
2. Fill each one of them upto half with water.
3. Add small amount of vinegar to beaker A, lemon juice to beaker B, mustard oil to beaker C and coconut oil to beaker D.
4. Stir the mixture with glass rod.
5. Allow the mixture undisturbed for sometime and observe the change.

### OBSERVATION

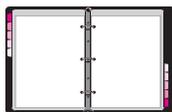
Vinegar and lemon juice mixes well in water so these are soluble whereas mustard oil and coconut oil do not mix in water, so these are insoluble.

**DIAGRAM**

**Figure:** Solubility of different liquids.

**CONCLUSION**

On the basis of above observation we can say that vinegar and lemon juice are soluble in water while mustard oil and coconut oil are insoluble in water.

**VIVA QUESTIONS**

**Q. 1. What are miscible liquids ?**

**Ans.** When the liquids mix completely, they are called miscible.

**Q. 2. Give two examples of miscible liquids.**

**Ans.** Alcohol and ink are miscible in water.

**Q. 3. Give two examples of miscible solids in water.**

**Ans.** Common salt, glucose.

**Q. 4. What are insoluble substances ?**

**Ans.** Substances which do not dissolve in water are called insoluble substances.

**Q. 5. Are gases soluble in water ?**

**Ans.** Solubility of gases in water is very less.

**Q. 6. Give two examples of immiscible liquids.**

**Ans.** Mustard oil and coconut oil are immiscible liquids.

**Q. 7. What are soluble substances ?**

**Ans.** The substances which completely disappeared in water are soluble.

**Q. 8. What is a solute ?**

**Ans.** It is the small component in the binary solution which is dissolved in solvent.

**Q. 9. What is solubility ?**

**Ans.** The maximum amount of a substance dissolved in a given volume of solvent is called solubility.

**Q. 10. Give the name of one solid organic compound which is dissolved in water ?**

**Ans.** Sugar.



## EXPERIMENT 5

### AIM

*To make a saturated solution.*

### MATERIALS REQUIRED

(i) Beaker, (ii) Water, (iii) Salt, (iv) Spoon, (v) Glass rod.

### THEORY

**Saturated solution.** A solution is said to be saturated if it holds the maximum amount of the solute at a given temperature in a given quantity of the solution.

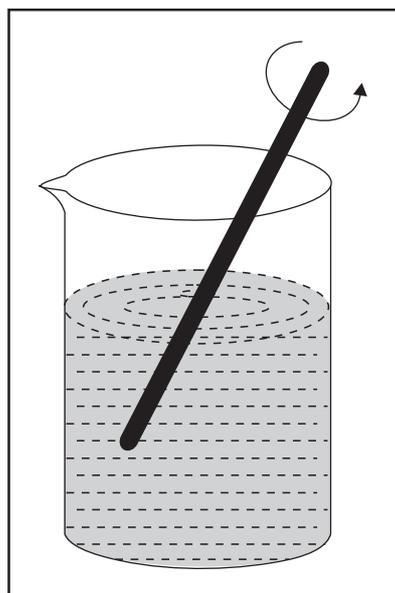
### PROCEDURE

1. Take a beaker and fill half of the beaker with water.
2. Add a teaspoon of salt to beaker and stir well till the salt dissolves.
3. Go on adding salt, one teaspoon at a time until it cannot dissolve any more salt.

### OBSERVATION

We get a saturated solution because no more salt can be dissolved in the amount of water we have taken.

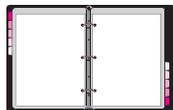
### DIAGRAM



**Figure:** Saturated solution.

## CONCLUSION

A solution becomes saturated when no more of a solute can be added to the solvent.



## VIVA QUESTIONS

**Q. 1. Define saturated solution.**

**Ans.** A saturated solution is one in which no more of a substance can be dissolved.

**Q. 2. What do you mean by solution ?**

**Ans.** A solution is prepared by dissolving a substance in a liquid.

**Q. 3. What will happen if we heat a saturated solution ?**

**Ans.** More of a substance can be dissolved in a solution by heating.

**Q. 4. Name the solvent which dissolves different amount of soluble substances.**

**Ans.** Water.

**Q. 5. What is a solute?**

**Ans.** The substance present in smaller amount in a solution is called solute.

**Q. 6. What is a solvent ?**

**Ans.** It is the component of the solution which is present in a large proportion.



## EXPERIMENT 6

### AIM

*To separate a mixture of sand, salt and iron filings.*

### MATERIALS REQUIRED

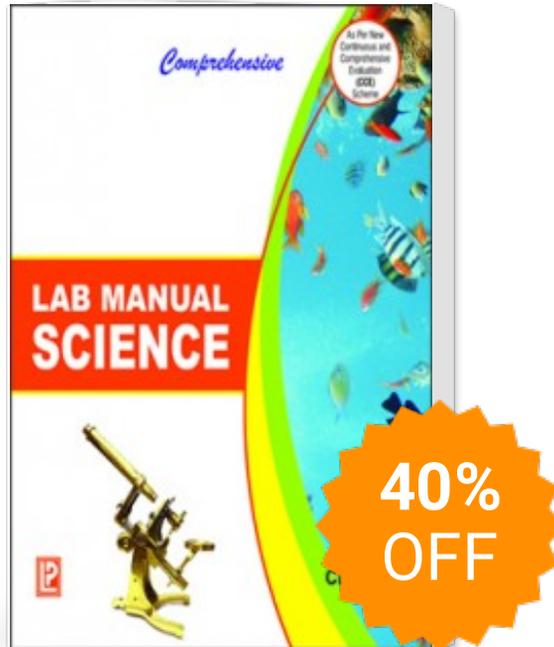
(i) Sand, (ii) Salt, (iii) Iron filings, (iv) Beaker, (v) Water, (vi) Paper, (vii) Magnet, (viii) Burner, (ix) Glass rod.

### THEORY

Many substances around us contain only one type of constituent particles. These are called pure substances. Substances containing more than one type of constituent particles are called impure substances. Impure substances can be separated by different methods like hand picking, winnowing, sieving, magnetic separation, sedimentation, decantation, loading, filtration, evaporation, sublimation, distillation, churning.

- **Sedimentation.** It is the process of settling of heavy solid particles in a mixture at the bottom of the vessel.

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