

Properties of Common Substances

Summary

Students will test the properties of some common substances and use their findings to identify an unknown mixture. They will relate the properties of the substances to the type of bonding they represent.

Time Frame

1 class periods of 90 minutes each

Group Size

Small Groups

Materials

- [student sheet](#)

(attached)

4 substances-salt, flour, sugar, baking soda and a mixture of sugar and baking soda. Corn starch may also be used.

hand lenses

small graduated cylinder

spoon or spatula

aluminum foil

alcohol or Bunsen burner (the alcohol burner is less apt to overheat the reaction)

wire stand or ring stand with ring and wire net

weak HCL

4 test tubes per group

test tube rack

beaker

textbook

Instructional Procedures

Gather the materials. The unknown mixture is half baking soda and half sugar. The aluminum foil needs to be cut into squares about 3 cm square. Each group needs 4 squares.

Hook activity: Show the students a white powdery substance and ask them what it is. They may have some guesses but won't be able to tell for sure. Have them make a list of the ways they tell what it is. They can do this as a group or individually. Make a list on the board of their answers. Discuss the ways that are safe vs. unsafe (tasting) and which a scientist might be more likely to do. Discuss when, in real life, an unknown substance needs to be identified (cocaine bust, evidence left at crime scene, discovery of substance in a mine etc.)

Read the introduction with students and go over location of materials and workstations. Remind students to wear their goggles.

Allow time for students to work.

Summarize lab with student groups reporting on what they think the unknown mixture is and why they think it is those substances.

Assessment Plan

Scoring Guide:

1. Students perform all tests and record data.....4

2. Students answer analysis questions accurately and completely.....4

Answers:

1. *Acid, heat-the results are clear and unique for each substance*
2. *Appearance and dissolving in water-the results do not separate one substance from another.*
3. *Flour and sugar or baking soda and salt.*
4. *They have similar bonding patterns*
5. *The unknown is baking soda and sugar because it fizzes like baking soda and melts like sugar.*
6. *Salt or baking soda*
7. *Artificial sweeteners don't melt or react with other ingredients the same way sugar does.*
8. *It probably is not corn starch, all properties should be the same.*

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

[Utah LessonPlans](#)