Name: _____ Group: _____ Date: _____

THE MATERIAL WORLD . . . . . .

THE PROPERTIES OF MATTER

STUDENT BOOK | Ch. 1, pp. 22–26

Characteristic physical properties, characteristic chemical properties

1. True or false?

a) Characteristic chemical properties involve primarily reactions to indicators. _____

b) The melting point is determined by the change of state of a substance. _____

c) Characteristic chemical properties are used to identify pure substances without changing their nature. _____

d) The boiling point is a characteristic chemical property. _____

e) Knowledge of characteristic properties allows us to identify pure substances. _____

f) The characteristic physical properties of substances remain the same regardless of pressure and temperature. _____

g) Characteristic physical properties are used to identify mixtures. _____

2. Check each description that is about characteristic properties of substances and indicate if it refers to chemical properties or physical properties.

Description	Characteristic chemical property	Characteristic physical property
a) A solution changes colour after iodine is added.	☐	☐
b) Limewater produces a precipitate when it comes into contact with carbon dioxide.	☐	☐
c) The round shape of a ball	☐	☐
d) The mass of a glass of water	☐	☐
e) Sugar's ability to dissolve in coffee	☐	☐
f) The volume of a helium-filled balloon	☐	☐
g) A flame that turns green when exposed to a given substance	☐	☐
h) A material that is a good conductor of electricity	☐	☐

Name: _____ Group: _____ Date: _____

Characteristic physical properties, characteristic chemical properties (*continued*)

3. Match each characteristic physical property with the corresponding example.

Characteristic physical property	Example
a) Solubility	1. The temperature of alcohol when it boils.
b) Melting point	2. Grams of salt per unit volume
c) Boiling point	3. The temperature of ice when it melts.
d) Density	4. The maximum quantity of CO_2 that can be dissolved in 1 L of a soft drink.

4. Match each characteristic chemical property with the corresponding example.

Characteristic chemical property	Example
a) Reaction to neutral litmus paper	1. Explosion in the presence of hydrogen gas
b) Reaction to limewater	2. Red in colour in the presence of a substance with a pH of 4
c) Reaction to a flame	3. Formation of precipitate when in contact with CO_2
d) Reaction to a glowing wood splint	4. Flame in the presence of oxygen
e) Reaction to cobalt chloride paper	5. Violet in colour in the presence of a substance that contains potassium
f) Reaction to a burning wood splint	6. Pink in colour in the presence of H_2O

5. Characteristic properties of matter are relied on to identify unknown pure substances. Referring to the following terms, indicate the substance that corresponds to each of the statements below.

A. Hydrogen B. Glycerin C. Tungsten D. Carbon dioxide E. Table salt

a) A grey and odourless solid substance that is not soluble in water and is a good conductor of electricity. _____

b) A viscous liquid that is soluble in water and explodes in the presence of certain substances. _____

c) A gas with a melting point of –259°C that explodes in the presence of a burning wood splint. _____

d) A solid substance with a solubility of 357 g/L and a boiling point of 1465°C _____

e) A colourless and odourless gas that clouds limewater and has a density of close to 0.002 g/L. _____

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THE PROPERTIES OF MATTER (*continued*)

STUDENT BOOK | Ch. 1, pp. 12–19

The properties of solutions

1. Circle each correct way to express concentration of a substance.

a) 100 g of sugar dissolved in water
b) A 100 mg/L solution of sodium bicarbonate
c) Cream of 5% w/w fat
d) 750 mL of hot chocolate
e) Sodium solution of 15% mass per volume

2. True or false?

a) The solubility of table salt increases with temperature. _____
b) An ink stain is easier to remove with an alcohol-based solvent than with a water-based solvent. _____
c) Carbon dioxide dissolves better at room temperature than at a temperature of 5°C. _____
d) The same units can be used to express solubility and concentration. _____
e) Soap is soluble in water and in oil. _____
f) A butter stain should be removed with a water-based solvent. _____

3. What am I?

a) In oil, I am highly soluble: I am what type of substance?

_____

b) I am the maximum quantity of solute that can dissolve in a certain volume of solvent.

_____

c) I am a homogeneous mixture of components that cannot be distinguished.

_____

d) I am an excess solute deposited in a solution.

_____

e) I am the space occupied by a liquid in a solution.

_____

f) I am the process that involves reducing concentration of a solution by adding solvent.

_____

g) I am a substance dissolved in another substance and generally present in lesser quantity.

_____

h) I am a solution with the maximum level of solute dissolved in a solvent.

_____