

Quiz (Use of Periodic Table)

1. Francium (Fr) is an element below caesium (Cs) in the Periodic Table.
 - (a) To which group does francium belong?
 - (b) Is francium a metal or non-metal?
 - (c) Sodium is a silvery solid. It can be easily cut with a knife. Predict the appearance of francium. Do you think francium can be easily cut with a knife?
 - (d) When caesium reacts with water, an explosive reaction occurs. Predict the observation when francium reacts with water. Explain your answer.
 - (e) Suggest a method to store francium in the laboratory.

2. Refer to Group II of the Periodic Table.
 - (a) How many outermost shell electrons do atoms of Group II elements have?
 - (b) The chemical properties of Group II elements are generally similar. Explain briefly.
 - (c) Does the reactivity of Group II elements increase or decrease down the group?
 - (d) Magnesium has almost no reaction with cold water, while calcium reacts with cold water at a moderate rate. Based on this piece of information, predict the rate of reaction of (i) beryllium (ii) barium with cold water.
 - (e) Name the gaseous product of the reaction between calcium and water.
 - (f) Strontium reacts with oxygen when exposed to air. Thus, the metal has to be stored under paraffin oil. In view of this, suggest how barium metal should be stored.

3. Xenon is an unreactive element. It is in the same group as helium and is commonly used in flash lamps.
 - (a) To which group of the Periodic Table does xenon belong?
 - (b) What is the special name of the group which xenon belongs to?
 - (c) How many outermost shell electrons are present in
 - (i) a helium atom?
 - (ii) a xenon atom?
 - (d) Predict the physical state of xenon under room conditions.
 - (e) Is xenon chemically reactive? Explain briefly.
 - (f) Helium is used to fill balloons and airships. Predict, with explanation, what will happen if a balloon filled with xenon is released from the top of a building?

4. Chlorine, bromine and iodine are elements in Group VII of the Periodic Table.
 - (a) How many outermost shell electrons do Group VII elements have?
 - (b) What is the special name of this group of elements?
 - (c) Describe the change in colour and physical state of the elements from chlorine to iodine.
 - (d) Astatine is an element below iodine in the Periodic Table. Since it is unstable and radioactive, little information about its properties is known. Based on what you have learnt about chlorine, bromine and iodine,
 - (i) predict the appearance of astatine.
 - (ii) predict what would happen when astatine is put into a test tube of hydrogen under sunlight. Explain your answer.

Suggested Answer

1.
 - (a) Group I
 - (b) It is a metal.
 - (c) Like sodium, francium is a silvery solid. Yes, it can be easily cut with a knife.
 - (d) Francium reacts with water explosively. The reactivity of Group I elements increases down the group, so francium should be more reactive than caesium.
 - (e) It should be stored under paraffin oil.

2.
 - (a) 2
 - (b) They all have two electrons in the outermost shell of their atoms.
 - (c) The reactivity of Group II elements increases down the group.
 - (d)
 - (i) Beryllium has no reaction with water.
 - (ii) Barium reacts vigorously with water.
 - (e) Hydrogen
 - (f) Barium is more reactive than strontium. It should be stored under paraffin oil.

3.
 - (a) Group 0 / VIII
 - (b) Noble gases
 - (c)
 - (i) 2
 - (ii) 8
 - (d) Xenon is a gas under room conditions.
 - (e) Xenon is unreactive. This is because it has a stable electronic structure / has an octet of electrons/has 8 electrons in the outermost shell.
 - (f) The balloon falls to the ground because xenon is denser than air.

4.
 - (a) 7
 - (b) Halogens
 - (c) The colours of elements become darkened down the group. They change from greenish yellow gas (chlorine) to dark red liquid (bromine) and then black solid (iodine).
 - (d)
 - (i) Black solid
 - (ii) There is no reaction between iodine and hydrogen. Besides, the reactivity of Group VII elements decreases down the group. Hence, astatine should have no reaction with hydrogen.