AN ROINN OIDEACHAIS

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1956.

CHEMISTRY.—PASS.

TUESDAY, 12*th JUNE*.—AFTERNOON, 3 TO 5.30.

Not more than *six* questions to be answered.

Chemical changes should be expressed by equations as well as in words.

Gram-molecular volume=22·4 litres.

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1. Explain what is meant by *any four* of the following terms, giving one example in each case to illustrate your explanation :—(*a*) oxidation, (*b*) dissociation, (*c*) synthesis, (*d*) double decomposition, (*e*) hydrolysis, (*f*) electrolysis.

[66 marks.]

2. Define :—(*a*) mixture, (*b*) compound.

Give (i) an account of the composition of the atmosphere, (ii) as many reasons as you can for believing that atmospheric air is a mixture and not a compound.

[66 marks.]

3. What is the position of magnesium in the Periodic Table ? Name two other elements which occur in the same group as magnesium.

Describe the action of the following on magnesium and in each case mention any conditions pertaining to the action :—(*a*) oxygen, (*b*) chlorine, (*c*) steam.

Sketch the apparatus you would use to investigate the action in the case of (*c*).

[66 marks.]

4. Describe fully, with the aid of a sketch of the apparatus, how you would prepare dry hydrogen chloride and how you would measure its density.

[66 marks.]

5. Give the names and formulae for the oxides of nitrogen and show how these substances can be used to illustrate one of the fundamental laws of chemistry.

State the law, and give the name of its discoverer.

[66 marks.]

6. Describe fully, with the aid of a sketch of the apparatus, how you would find the volume composition of carbon dioxide.

Give a brief account of the additional evidence required to establish the formula for a molecule of carbon dioxide.

[66 marks.]

7. Explain what is meant by the following :—(*a*) atomic weight, (*b*) electron, (*c*) nucleus, (*d*) nuclear charge. Illustrate your answer by reference to the structure of the atom of any named element.

Are all the atoms of any element exactly alike ?

[67 marks.]

8. Describe, with the aid of a sketch of the apparatus, how you would prepare and collect hydrogen sulphide. Give an account of its physical properties.

Describe what may be observed when hydrogen sulphide (*a*) is mixed with sulphur dioxide, (*b*) is passed into chlorine water, (*c*) is passed into a solution of copper sulphate in water.

In each case, explain the reaction which occurs and illustrate it by means of a chemical equation.

[67 marks.]

9. Contrast the properties of white phosphorus with those of red phosphorus.

Describe (*a*) how white phosphorus may be converted into red phosphorus, (*b*) how ortho-phosphoric acid may be obtained from red phosphorus.

[67 marks.]

10. Write a note on valency, referring to the valency of each of the following :—sodium, chlorine, aluminium, carbon, iron, phosphorus.

When 9 gms. of a metal, of specific heat 0·21, are added to an acid, 11·2 litres of hydrogen, measured at S.T.P., are displaced. Calculate from these figures the valency of the metal.

[67 marks.]