A STUDY OF RADIATIONS AND ITS TYPE

Monika Khetarpal

Department of Physics, Government Dungar College, Bikaner, 334001 (Rajasthan) India

Abstract

Radioactivity is the dangerous part of our planet. Lives threatening radioactive materials are present in floor and walls of the houses we live in, the food we eat and drink they are even present in the air we breathe. The present paper aims to provide an overview of radiation, its types and their harmful influence on the living beings. During radioactive decay a particle can emit alpha particle, beta particle or gamma particle to attain stability.

Index Terms- Radiations, non-ionising radiations, ionising radiations, dangerous, energy.

I.INTRODUCTION

Radioactive pollution is one of the most dangerous pollution effecting the environment enormously. Radioactive pollution refers to increase in the level of nuclear radiations in the environment that can cause harm to humans, animals and plants. 20% of radiations we are exposed to are because of human activities. Activities through which dangerous radiations are emitted incorporate mining, handling and storage of radioactive waste, research activities related to radioactive particles along with the use of radiations in medical field.

II.RADIATIONS

Radiation is energy travelling through space. Transportation of energy occurs in the form of electromagnetic radiations or in the form of energetic particles which are electrically charged or neutral. Electromagnetic radiations are emitted in various forms these forms incorporate radio waves, infrared and ultraviolet light, X-rays and gamma rays. The physical properties such as wavelength, frequency and energy of these forms are different. All these forms of radiations are the source of radioactive pollution. The amount of pollution generated by them varies. High energy radiations emitted have higher risk of pollution.

The atom is building block of matter which comprises of a small massive nucleus surrounded by a cloud of electrons. The nucleus consists of positively charged protons and neural neutrons. A situation when there exits more number of neutrons or protons, this is an unbalanced state, and an unstable nucleus is there. This unstable nucleus will tend to attain the stability by undergoing radioactive decay. Alpha particles, beta particles and gamma particles are emitted during radioactive decay.

1. Alpha particles (α)

Alpha particles are positively charged nuclei of helium atom consisting of two protons and two neutrons. These particles are highly energetic. There emission occurs from the heavier nuclides such as uranium-238, radium-226, and polonium-210. They can be absorbed completely by paper or skin.

2. Beta particles (β)

Beta particles are negatively charged electrons. Both artificial and natural radiation sources generate beta particles. There emission occurs from tritium, carbon-14 and strontium-90. Penetrating power of beta particles is more than alpha particles. They are totally absorbed by the sheet of plastic or metal.

3. Gamma rays (γ)

Gamma rays are neutral electromagnetic radiations. In the environment the naturally occurring source is potassium-40, which is present in human body. Artificial sources of gamma rays are cobalt-60 and cesium-137. They have high penetration strength. They can penetrate through the living tissue for short distance.

III.TYPES OF RADIATION

Radiation is basically energy that travels and spread out in the environment. Radiations are classified as ionising and non-ionising radiations. Both types of radiations are harmful to mankind. The two types of radiations are:

1. Non-ionising radiations

Non-ionising radiations are the radiations of low energy and longer wavelengths. The energy is low so they are not able to ionise atoms or molecules. Radiations emitted from Microwave ovens, cellular phones, FM and AM radios and cordless phones are examples of non-ionising radiations. Non-ionising radiations are less dangerous as compared to ionising radiations.

2. Ionising radiations

Ionising radiations are electromagnetic radiations of high energy. These are generated during radioactive decay and on passing through a medium they can cause ionisation of atoms or molecules present and can result in the formation of charged particles. During radioactive decay alpha, beta and gamma radiations are generated. These radiations can affect a non-radioactive material to become radioactive. Thus ionising radiations can cause an atom to liberate free electron. This free electron is very dangerous because it can strongly influence biochemical such as lipids and nucleic acids. Harmful health issues like cancer can happen and if long exposure to these radiations occurs it can even lead to death.

IV.CONCLUSIONS

Radioactive pollution has been a global concern. The term radiation is extremely broad. Radiations are classified as ionising and non-ionising radiations, depending on energy of liberated particles. As the energy of non-ionising radiation is less as compared to ionising radiation they are comparatively less harmful but still there dangerous effect cannot be ignored. Ionising radiations on penetrating into the matter becomes electrically charged and these can significantly be harmful as they greatly influence the normal biological process.

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