

On radiation

[Science](#), [Chemistry](#)



14 December Radiation Radiation is a form of energy that is emitted from some source and is able to travel in the space as well as penetrate into other materials. There are two basic types of radiation, namely the ionizing radiation and the nonionizing radiation. The ionizing radiation produces ions in matter unlike the nonionizing radiation. In other words, radiation can be electromagnetic or particulate. Examples of electromagnetic radiation are x rays and gamma radiation whereas examples of particulate radiation are alpha radiation and beta radiation. The nonionizing radiation includes but is not limited to microwave, radio and light. Unstable atoms produce the ionizing radiation. Unstable atoms are the atoms with either excess mass or excess energy or both unlike the stable atoms. The unstable nuclei of the atoms provide them with the radioactive properties. These atoms release excess mass or energy in an attempt to gain stability. It is this excess mass or energy that is called as radiation. High voltage devices like the x-ray machines are used to produce radiation.

Measurement of radiation is complicated and involves use of different kinds of units. The amount of the emitted radiation is conventionally measured in the curie (Ci). The SI unit for the measurement of radiation is the Becquerel (Bq). “ These units express the number of disintegrations (or breakdowns in the nucleus of an element) per second as the element tries to reach a stable or nonradioactive state. One Bq is equal to one disintegration per second and one Ci is equal to 37 billion Bq” (Crosta). To measure the amount of radiation absorbed by the tissues in the human body, the SI unit gray (Gy) or the conventional unit Roentgen absorbed dose (rad) is used.

Radiation finds multiple uses in the field of medicine. Ways in which radiation

is employed in the medical imaging include but are not limited to projectional radiography, fluoroscopy, computed tomography, ultrasound, bone densitometry, medical resonance imaging, positron emission tomography, and dual energy X-ray absorptiometry. Depending upon the way radiation is generated for the clinical purposes, radiation therapies can be classified into Grenz-ray therapy, contact therapy, superficial therapy, deep therapy or orthovoltage therapy, supervoltage therapy, and megavoltage therapy (Khan 35-37). “ Medical uses of radiation, particularly diagnostic X rays, result in the largest average annual effective dose from man-made sources” (Turner 12). Ionizing radiation is used in radiotherapy for the treatment of such diseases as severe thyroid eye diseases, coronary artery disease, pterygium, cancer, and trigeminal neuralgia. Radiation may not be necessarily used in the form of rays. Radiation is also used in ways like injecting the radioactive isotopes and swallowing them as capsules or liquids.

Where there are numerous uses of radiation in the treatment of diseases and medical imaging, there are also certain side effects of radiation. Common side effects of the use of radiation on humans include infertility, fatigue, skin damage, hair loss, swelling, fibroses, dryness of the salivary, cancer, sweat glands and swelling. Despite all these side effects of radiation, its uses far outweigh its risks.

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