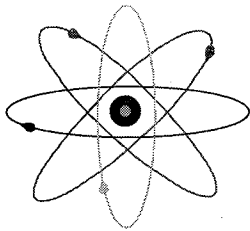




US Army Corps
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FUSRAP Fact Sheet

How Big is a Picocurie?

U.S. Army Corps of Engineers • Buffalo District

This is one in a series of fact sheets that provide information about regulatory, technical, and other issues considered in decision-making within the Formerly Utilized Sites Remedial Action Program (FUSRAP). This fact sheet discusses how radiation is measured.

The *curie* is a standard measure for the intensity of radioactivity contained in a sample of radioactive material. It was named after French scientists Marie and Pierre Curie for their landmark research into the nature of radioactivity.

The basis for the curie is the radioactivity of one gram of radium. Radium decays at a rate of about 2.2 trillion disintegrations (2.2×10^{12}) per minute. A *picocurie* is one trillionth of a curie. Thus, a picocurie (abbreviated as pCi) represents 2.2 disintegrations per minute.

To put the relative size of one trillionth into perspective, consider that if the Earth were reduced to one trillionth of its diameter, the "picoEarth" would be smaller in diameter than a speck of dust. In fact, it would be six times smaller than the thickness of a human hair.

The difference between the curie and the picocurie is so vast that other metric units are used between them. These are as follows:

| | |
|--------------|---|
| Millicurie = | 1/1,000 (one thousandth) of a curie |
| Microcurie = | 1/1,000,000 (one millionth) of a curie |
| Nanocurie = | 1/1,000,000,000 (one billionth) of a curie |
| Picocurie = | 1/1,000,000,000,000 (one trillionth) of a curie |

The following chart shows the relative differences between the units and gives analogies in dollars. It also gives examples of where these various amounts of radioactivity could typically be found. The number of disintegrations per minute has been rounded off for the chart.

| Unit of Radioactivity | Symbol | Disintegrations per Minute | Dollar Analogy | Examples of Rad. Materials |
|-----------------------|----------|----------------------------|---|---------------------------------------|
| 1 Curie | Ci | 2 trillion | 2 times the annual federal budget | Nuclear Medicine Generator |
| 1 Millicurie | mCi | 2 Billion | Cost of a new inter-state highway from Atlanta to San Francisco | Amount used for a brain or liver scan |
| 1 Microcurie | μ Ci | 2 Million | All-Star baseball player's salary | Amount used in thyroid tests |
| 1 Nanocurie | nCi | 2 Thousand | Annual home energy costs | Consumer products |
| 1 Picocurie | pCi | 2 | Cost of a hamburger and Coke | Background environment levels |