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Solution of the decay equation of the three natural decay series-Analytical Methods

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Abstract

The three naturally occurring radioactive decay series i.e. the thorium series, the uranium series, and the actinium series are studied. The solutions of these series are obtained by writing them as set of coupled ordinary first differential equations and then solving them. This will help us to calculate the number density as a function of time and hence calculate the activity of the isotopes and therefore the decay heat produced in the reactor. The equations here are solved by analytic method. An attempt is also made to compare the solutions obtained with those given in the review paper on decay heat by A. Tobias [6]. Some standard problems are also solved using these decay solutions.