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Age of the Universe: Manifestation and Disintegration of the Matter in Spacetime - A Geochmeical/Isotopic Perspective

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One can calculate the time of manifestation (Tm) of any unstable parent isotope by assuming that all their daughter isotopes owe their existence only to the decay of their parent isotopes by using the radioactivity equation: $Np = Ni \exp(-\lambda Tm)$, where Np is the total number of parent nuclides existing in the Universe at the present time, Ni is the total number of parent nuclides formed in the Universe, and λ is the decay constant, and Tm is the time of manifestation of the parent isotope in the Universe. In this equation all the entities are known except for the time of manifestation (Tm). When we find the time of manifestation (Tm) of the various isotopes this way we see that there is no order between the time of manifestation (Tm) and their respective atomic mass.

We can also calculate the time of manifestation (Tm) of any unstable isotope by extrapolating backwards its present-day daughter isotope ratio through its isotope ratio at the time of formation of Earth 4.55 Gyr ago to the X-axis. The X-intercept thus formed would denote the time of manifestation (Tm) of their parent isotope. The Tm of various unstable isotopes if plotted against their respective atomic mass shows a high degree of negative correlation, and the linear array thus formed (Cosmochron) intercepts the X-axis at ~936 Gyr ago which indicates the age of the Universe. Similarly, the time of complete decay of any unstable isotope can also be estimated by extrapolating its parent isotope ratio in the planet Earth at the time of its formation 4.55 Gyr ago through its present-day ratio to the X-axis. The X-intercept thus formed yields the time of complete decay (Td) of the parent isotope.

The Td + Tm = Te (the time of total existence) of the parent isotope. If the Te of the various unstable isotopes is plotted against their respective atomic mass the linear array thus formed (Dotuchron) intercepts the X-axis at ~1104 Gyr which indicates the time of total existence of the Universe since its creation. Another important thing to note is that in both the plots the linear array thus formed intercepts the Y-axis at the atomic mass of ~242 which indicates the heaviest mass of any isotope that could exist in the Universe.