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Low Energy Linear Accelerator-Driven Subcritical Molten Salt Reactor to Produce Clean CO2-Free Energy with Stirling Cycle

Abstract
A radiotherapy electron accelerator (LINAC) operating on the usual bremsstrahlung producing energetic photons (5.5 –25 MeV) provides demonstrated [,] neutron production when operating in the Giant Dipole Resonance (GDR) region where most medical linacs are actively operated. It is employed with effectiveness to induce neutrons via the reactions (γ , n), (γ , fis) and (e , e'n) in the accelerator's W-target and thereby controlling fission energy production in a subcritical Accelerator Driven Molten Salt Reactor operating in a thermal neutron regime. FliBe molten salt with dissolved 0.25 mol% fissile 335U, 233U or 239Pu provide the reaction media with power totally controlled by the external electron accelerator neutron source. The thermal energy is used to drive a Stirling cycle motor to directly provide electric power production.

1 R. R. Martín-Landrove, E. D. Greaves, L. Sajo-Bohus, et al. (2015) GDR in Radiotherapy Treatment Fields with 18 MV Accelerators. pp 369-376 In PROCEEDINGS OF THE 14th INTERNATIONAL CONFERENCE ON NUCLEAR REACTION MECHANISMS Varenna, June 15 –19, 2015,

2 L. Sajo-Bohus and E. D. Greaves. (2016) Low energy linear accelerator-driven subcritical assembly. In Chap.15 of Molten Salt Reactors and Thorium Energy. Ed. Thomas Dolan, Pub. Elsevier.

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