

Abstract Submitted  
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**The Radioactive Decay of Beryllium-7** KELLEN GIRAUD, GRANT HART, BRYAN PETERSON, TAKESHI NAKATA, BYU — There are about 95 radioactive isotopes that decay exclusively through electron capture. The energy available for decay is not adequate for electron-positron pair production, the only other possible route for an atom that is neutron-poor to decay. Beryllium-7 is the lightest isotope that decays only through electron capture. Because Be-7 requires the presence of electrons to decay it is possible to modify the decay rate by modifying the electronic structure of the atom through chemical bonding, application of high pressure, or ionization. And because Be only has 4 electrons this effect is much stronger than in heavier elements. Be-7 is naturally found in two locations that are of interest to us: in the core of the sun as part of the fusion cycle, and in the atmosphere due to cosmic ray interactions with atmospheric gases. I will present an overview of where the Be-7 comes from, what happens to it after it is formed, and some areas, such as geology and stellar physics, where information about Be-7 can be used to understand other processes. I will then describe the efforts that are currently underway at BYU to trap a non-neutral plasma comprised of ionized Be-7 to investigate the effect of ionization on the decay rate.

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