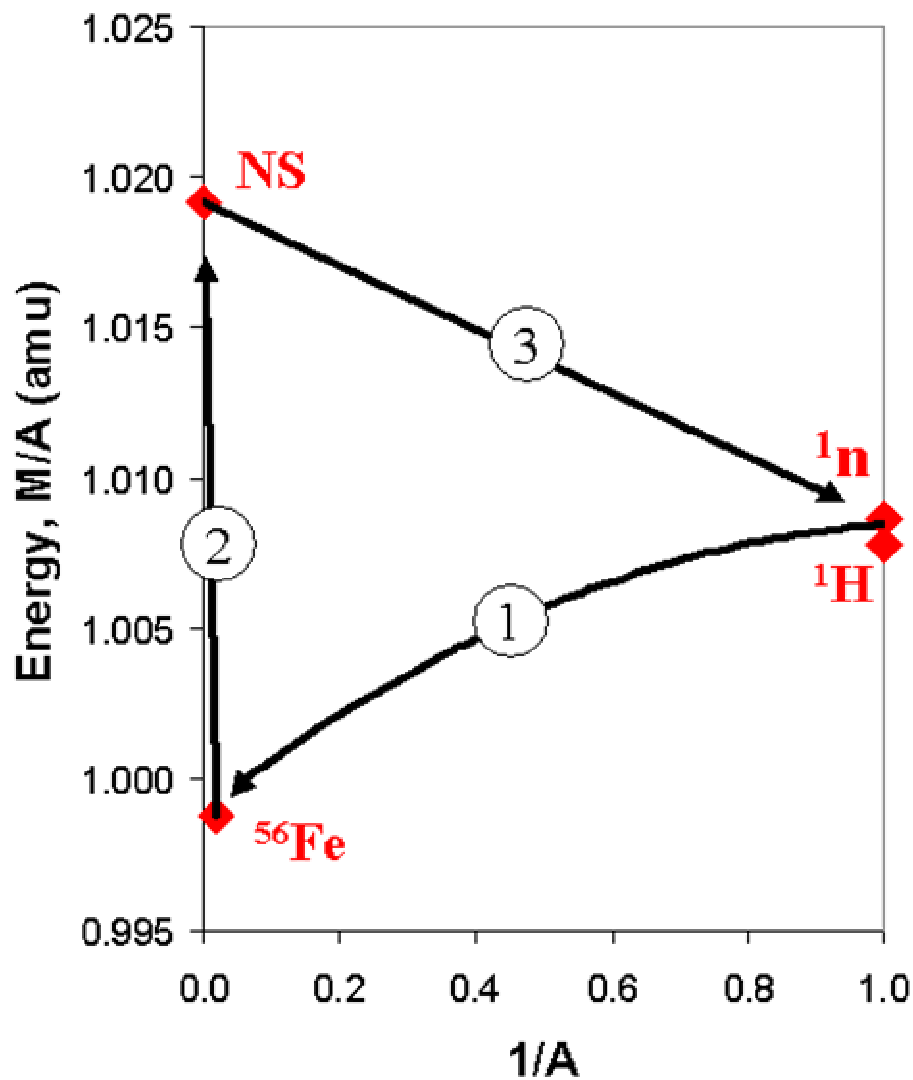


Fusion and Dissociation of Nuclei in Stars



Nuclear evolution in the Sun and other stars, illustrated on a plot of M/A vs. $1/A$. **1.** First generation stars fuse ${}^1\text{H}$ into heavier nuclides. **2.** At the end of their lives, material in the core is compressed into a neutron star (NS). Our Sun formed on this product. **3.** The NS acts as a giant nucleus, decaying by neutron emission ($Q = 10^{-22}$ Mev per neutron; $t_{1/2} \approx 10^{10}$ years). **4. = 1.** Most of the neutron decay product, ${}^1\text{H}$, is consumed by fusion as it moves upward, carrying lighter nuclides to the solar surface. This fusion repeats step # **1**. Each year, 3×10^{43} H^+ ions reach the solar surface and leave in the solar wind.