DOES THE MAIN COMPONENT OF THE S-PROCESS IN AGB STARS CONSTRAIN THE NEUTRON SOURCE IN THE 13C-POCKET?

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The main component of the *s* process is mainly produced in low-mass AGB stars by the $^{13}C(\alpha,n)^{16}O$ reaction, requiring proton injection from the envelope. The ^{13}C pocket was typically assumed to involve a small mass ($\leq 10^{-3}$ $M_\odot$) [1], but models with rotation suggest that ^{14}N hampers *s*-processing [2] in such tiny layers. Recent spectroscopy of young open clusters [3], showing enhancements of *s*-element abundances with respect to the Sun, suggest more effective *s*-process production requiring ^{13}C-rich layers extended in mass ($\geq 4x10^{-3}$ $M_\odot$). We speculated that mixing driven by magnetic buoyancy [4,5] (or other forced mechanisms "from bottom to top") can form a ^{13}C reservoir larger than assumed so far, covering most of the He-rich layers. We present new calculations [4] aiming at understanding if the solar composition helps to constrain the ^{13}C pocket extension. Stellar models at a fixed metallicity, based on a large ^{13}C reservoir reproduce the main *s*-component as accurately as before and they don't require any nuclear contribution from an unknown nucleosynthesis processes *(LEPP*). These models also avoid problems of mixing at the envelope border and fulfil requirements from C-star luminosities. A large production of nuclei below A=100 is expected, so that $^{86,87}Sr$ may be fully synthesized by AGB stars, while ^{88}Sr, ^{89}Y and ^{94}Zr are contributed more efficiently than before. We finally suggest tests that could provide more strict constraints for the extension of the ^{13}C pocket.

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