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Reduced Uncertainties in the Supernova Production of the Gamma Emitting Nuclei ^{26}Al, ^{44}Ti, and ^{60}Fe Using Effective Helium Burning Rates[1] SAM M AUSTIN, Michigan State Univ, CHRISTOPHER WEST, Metropolitan State Univ., ALEXANDER HEGER, Monash Univ — Uncertainties in the helium burning reaction rates caused large uncertainties in previous predictions of the production of the gamma emitting nuclei ^{26}Al and (especially) ^{60}Fe in core collapse supernovae. This precluded a meaningful comparison of the predictions with observed gamma ray intensities. We present results using a newly developed effective reaction rate (ERR) for the helium burning reactions to predict the yields of ^{26}Al, ^{44}Ti, and ^{60}Fe. The resulting yield uncertainties using the ERR are much smaller than obtained previously, and smaller than other uncertainties. The yield ratio, ^{60}Fe/^{26}Al, had variations of less than 20 percent and appears to be the most robust observable related to the production of these nuclei. We also estimated the effects of failed supernovae on the yields by using a compactness filter. This substantially reduced the three yields but the ratio, ^{60}Fe/^{26}Al, was little affected.

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