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Trends in ^{44}Ti and ^{56}Ni from Core-Collapse Supernovae GEORGIOS MAGKOTSIOS, Department of Physics, University of Notre Dame, FRANCIS TIMMES, School of Earth and Space Exploration, Arizona State University, AIMEE HUNGERFORD, CHRISTOPHER FRYER, Los Alamos National Laboratory, Los Alamos, PATRICK YOUNG, School of Earth and Space Exploration, Arizona State University, MICHAEL WIESCHER, Department of Physics, University of Notre Dame — We compare the yields of ^{44}Ti and ^{56}Ni produced from post-processing the thermodynamic trajectories from three different core-collapse models with the yields from exponential and power-law trajectories. The peak temperatures and densities achieved in these core-collapse models span several of the distinct nucleosynthesis regions we identify, resulting in different trends in the ^{44}Ti and ^{56}Ni yields for different mass elements. The ^{44}Ti and ^{56}Ni mass fraction profiles from the exponential and power-law profiles generally explain the tendencies of the post-processed yields, depending on which regions are traversed by the model. We also analyze the influence of specific nuclear reactions on the ^{44}Ti and ^{56}Ni abundance evolution. Our analysis suggests that not all ^{44}Ti need be produced in an α-rich freeze-out in core-collapse events, and that reaction rate equilibria in combination with timescale effects for the expansion profile may account for the paucity of ^{44}Ti observed in supernovae remnants.

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