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**Do R Coronae Borealis Stars Form from Double White Dwarf Mergers?**[1] PATRICK MOTL, Indiana University Kokomo, JAN STAFF, Macquarie University, ATHIRA MENON, FALK HERWIG, University of Victoria, WESLEY EVEN, CHRIS FRYER, Los Alamos National Laboratory, TOM GEBALLE, Gemini Observatory, MARCO PIGNATARI, University of Basel, GEOFFREY CLAYTON, JOEL TOHLINE, Louisiana State University — A leading formation scenario for the irregular variable R Coronae Borealis (RCB) stars invokes the merger of a degenerate Helium white dwarf with a Carbon-Oxygen white dwarf in a binary. The observed ratio of $^{16}O/^{18}O$ for RCB stars is in the range of 0.3 - 20, much smaller than the solar value of 500. We report on our investigations into whether such a low oxygen isotope ratio can be obtained in simulations of double white dwarf mergers. We identify a "shell of fire" feature in the simulations surrounding the merged object where temperatures and densities are favorable for forming $^{18}O$ for binaries with initial mass ratios near 0.7. However, the accretion stream's impact dredges up $^{16}O$ from the Carbon-Oxygen white dwarf which forms a competing process that raises the oxygen isotope ratio. We present the most favorable scenarios we have identified for creating RCB stars in light of these competing processes and outline steps for future progress.

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