

MESA MODELS OF WD COOLING WITH C/O PHASE SEPARATION

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I will describe the recent implementation of C/O phase separation for crystallizing white dwarf models in the MESA stellar evolution code. In combination with the Skye equation of state that MESA uses for WD interiors, this implementation allows unprecedented thermodynamic consistency in evaluating the energetics associated with WD crystallization, including terms for both latent heat and mixing of C/O in the liquid mantle surrounding the solid WD core. I will show some comparisons of cooling delays in MESA models and other WD codes that include phase separation. I will then discuss some of the subtleties associated with including both C/O phase separation and other potential sources of WD cooling delays such as ^{22}Ne sedimentation in the same model, and touch on some implications for WD populations that seem to experience long cooling delays associated with crystallization such as the WD Q -branch and the open cluster NGC 6791.