

Abstract Submitted
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Molecular Dynamics simulations of Carbon-Oxygen mixtures in the Core of White Dwarf Stars ANDRE DA SILVA SCHNEIDER, JOE HUGHTO, CHARLES HOROWITZ, DON BERRY, Indiana University — A White Dwarf will be the final evolutionary state of most of the stars in our galaxy. The core of these faint and compact stars is a mixture of ions immersed in a degenerate electron gas. The latent heat of fusion of this mixture is important for White Dwarf cooling from which the age of stellar systems can be inferred. Assuming Carbon and Oxygen to be the most abundant elements we studied the phase diagram of the mixture using large classical molecular dynamics simulations. The ion interactions were modeled by a screened Coulomb potential and the system was kept in a half-solid half-liquid state. Understanding the chemical separation that takes place helps estimate the central abundance of these elements and is important for observations of White Dwarfs in globular star clusters [1].

[1] C.J. Horowitz, A.S. Schneider, and D.K. Berry, Physical Review Letters 104, 231101 (2010)

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