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Investigation of Dalton and Amagats laws for gas mixtures with shock propagation[1] PATRICK WAYNE, IGNACIO TRUEBA MONJE, JASON H. YOO, C. RANDALL TRUMAN, PETER VOROBIEFF, University of New Mexico — Two common models describing gas mixtures are Daltons Law and Amagats Law (also known as the laws of partial pressures and partial volumes, respectively). Our work is focused on determining the suitability of these models to prediction of effects of shock propagation through gas mixtures. Experiments are conducted at the Shock Tube Facility at the University of New Mexico (UNM). To validate experimental data, possible sources of uncertainty associated with experimental setup are identified and analyzed. The gaseous mixture of interest consists of a prescribed combination of disparate gases – helium and sulfur hexafluoride (SF_6). The equations of state (EOS) considered are the ideal gas EOS for helium, and a virial EOS for SF_6.The values for the properties provided by these EOS are then used used to model shock propagation through the mixture in accordance with Dalton's and Amagat's laws. Results of the modeling are compared with experiment to determine which law produces better agreement for the mixture.

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