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Enhancement of Rb 5P fine-structure collisional transfer rates in dense inert buffer gas mixtures ALINA GEARBA, JEREMIAH WELLS, RANDY KNIZE, JERRY SELL, US Air Force Academy — Measurements of collisional fine-structure mixing rates between Rb 5P states in Rb-He-Ar and Rb-He-Xe gas mixtures will be presented. We have found that the Rb-He mixing rates are significantly increased by the addition of Ar or Xe, even though the Rb-Ar or Rb-Xe mixing cross sections are orders of magnitude smaller than that of Rb-He. Using Rb-inert gas interatomic potentials we have developed a model to explain our experimental results. Our model takes into account the decrease in Rb 5P fine-structure splitting at small internuclear distances which occurs at high buffer gas pressures. This results in an effective increase in the collisional excitation transfer cross section with buffer gas pressure. We will compare our experimental results to these simulated results and model what this effect would be in K and Cs with inert buffer gas mixtures.

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