

Pressure broadening and shift of Rb D₁ line in the presence of ²¹Ne

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²¹Ne used as the buffer gas in atomic comagnetometers is more widely due to small gyromagnetic ratio[1]. Here we report the pressure broadening and shift rates of Rb D₁ line in the presence of ²¹Ne gas over a range of number densities for the first time by means of laser absorption spectroscopy. We have also examined the temperature dependence of these collisional effects in a range of 373-413 K. These results are important to measurements of alkali mental number density in a cell[2].

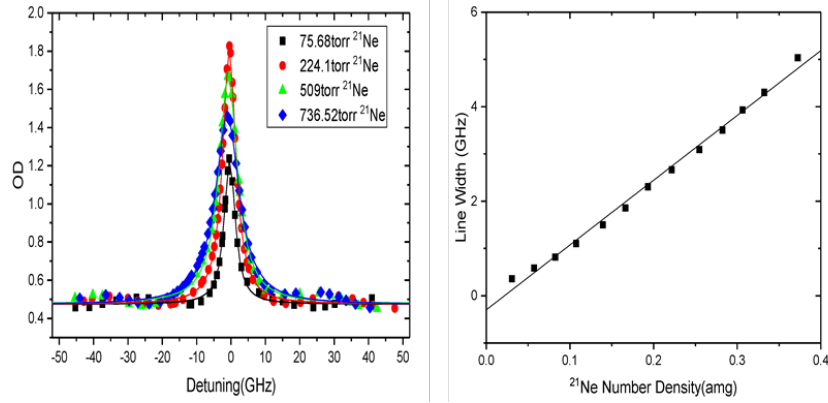


Figure 1. Measured linewidths for D₁ for Rb in presence of ²¹Ne at 373 K with fits.

[1] Smiciklas M , Brown J M , Cheuk L W , et al. New Test of Local Lorentz Invariance Using a ²¹Ne–Rb–K Comagnetometer PRL **107**, 171604 (2011).

[2] K. Wei, T. Zhao, X. Fang, et al. In-situ measurement of the density ratio of K-Rb hybrid vapor cell using spin-exchange collision mixing of the K and Rb light shifts, Opt. Express **27**, 16169-16183 (2019).