Quantitative spectroscopy of CH$_3$D in the near-IR is of importance for an ongoing project to build an instrument to measure the H/D isotopic ratio of methane gas. Continuous-wave cavity ring-down spectroscopy (CRDS) has been used to examine the absorption cross sections, the pressure-broadening and pressure-shift coefficients at around 1652 nm. The absorption cross sections of CH$_3$D were quantified in the wavenumber region between 6046 and 6060 cm$^{-1}$. The maximum peak is located at 6055.17 cm$^{-1}$, which gives $(8.58 \pm 0.37) \times 10^{-21}$ cm$^2$/molecule at the total pressure of $\sim$ 8.2 Torr of the N$_2$ buffer gas. By using the small step size of the laser wavenumber scan, we measured the pressure-broadening effects, and the pressure-shift effects, on CH$_4$ and CH$_3$D absorption lines. The N$_2$, O$_2$ and CO$_2$ pressure broadening coefficients of CH$_3$D are 0.058, 0.054 and 0.049 cm$^{-1}$/atm, respectively, at the wavenumber we employed. Under the experimental conditions we used, N$_2$ and O$_2$ have very similar pressure broadening effects, and their effects on CH$_3$D is very similar to those of CH$_4$. At the wavenumber we employed, the same values of N$_2$ and O$_2$ pressure-shift coefficient , - 0.012 cm$^{-1}$/atm, and a little higher value of CO$_2$, - 0.013 cm$^{-1}$/atm, were found.