Previously, we have reported the $\Sigma_0 \rightarrow \Pi_1$ vibrational-tunneling-rotational (VTR) transition in the Ar·ND$_3$ complex.$^a$ Here we report the first observation of the corresponding transition in the Ne·ND$_3$ and Kr·ND$_3$ complexes using a pulsed jet FASSST spectrometer operating in the 195-298 GHz region. The inversion components of the VTR band corresponding to different nuclear spin states, are observed for all complexes Rg·ND$_3$ (Rg = Ne, Ar, Kr). The experimental data were fit to a pseudo-diatomic Hamiltonian,$^b$ yielding molecular constants, including the value of the inversion splitting, $\Delta$, in the complexes. A semiquantitative model of the (moderate) quenching of the inversion splitting in the complex is proposed.

$^a$D.Melnik, S.Gopalakrishnan, T.A.Miller, and F.C.De Lucia, 54th International Symposium on Molecular Spectroscopy