Tunneling switching is a fundamental phenomenon of interest in molecular quantum dynamics including also chiral molecules and parity violation.\textsuperscript{a,b,c} Deuterated phenols have been identified as prototypical achiral candidates.\textsuperscript{d} We report the high resolution spectroscopic investigation of the ortho-D-phenol in the GHz and THz ranges following our recent discovery of tunneling switching in its isotopomer meta-D-phenol.\textsuperscript{e} Here we report new results on ortho-D-phenol. The pure rotational spectra were recorded in the range of 72-117 GHz and assigned to the syn- and anti- structures in the ground and the first excited torsional states. Specific torsional states were assigned based on a comparison of experimental rotational constants with the quasiadiabatic channel reaction path Hamiltonian (RPH) calculations. The torsional fundamental at 308 cm\textsuperscript{-1} and the first hot band at 275 cm\textsuperscript{-1} were subsequently assigned. The analyses of pure rotational and rovibrational spectra shall be discussed in detail in relation to possible tunneling switching.

\textsuperscript{c}S. Albert, Z. Chen, C. Fábri, R. Prentner M. Quack and D. Zindel, paper at this meeting.