Natrochalcite compounds, currently discussed as an anode material for Li-/Na-ion batteries [1], exhibit hydrogen-bond lengths that are among hydrogen-bearing solids some of the shortest ones reported so far [2]. Furthermore, at high-pressure the formation of an extremely short single-well no-barrier hydrogen bond is possible.

At ambient pressure the space group of natrochalcite is $C2/m$ [3]. The XRD measurements performed between 0.4 and 10 GPa showed the Bravais lattice centering to remain and the continuous decrease of the hydrogen bonds, respectively their $O\cdots O$ distances. However, the Raman spectra show clear changes in the $SO_4$ bending region. Furthermore, all the oxygen atoms of the $SO_4$-tetrahedron clearly show higher isotropic displacement parameters compared to the only oxygen not involved in this polyhedron. The acceptor oxygen for the longer hydrogen bond, shrinks about 0.18(2) Å until 10 GPa and shows the strongest displacement starting at ambient pressure up to 10 GPa, when refined in $C2/m$.

Since all the oxygens of the $SO_4$-tetrahedron are shared with Na-polyhedra it is very likely that at least for these polyhedra the symmetry is lowered above 2 GPa. Due to the preserved C-centering only two space groups are reasonable then, $Cm$ and $C2$.