Structural and electronic properties of aluminate nanotubes KEE JOO CHANG, YONG-JU KANG, Department of Physics, Korea Advanced Institute of Science and Technology — Recently, lithium containing aluminate nanotubes have been synthesized by the surfactant templating method. However, their structural and electronic properties have not been clearly understood yet. In this work, using first-principles theoretical calculations, we present a stable tubular structure in the form of $\text{AlO}_2$, which is energetically stable with fewer strain energies, compared with $\text{MoS}_2$ nanotubes with similar diameters. All the $\text{AlO}_2$ nanotubes are metallic with pseudogaps, independent of chilality. For small diameter zigzag tubes, more electron conduction occurs through the outer O shell with longer Al-O bonds, while the whole tube wall contributes to electron conduction for large diameter tubes or armchair tubes, which have similar inner and outer Al-O bond lengths. We find that an AlO tubular form can be stabilized by hole doping.