The equilibrium geometry of the ground electronic state of C\(_3\)Ar has been determined to be T-shaped at the level of CCSD(T)/cc-pVQZ: \(\ell(C - C) = 1.298\ \text{Å}, \ \angle C - C - C = 173.75^\circ, \ \ell(C_3 - Ar) = 3.85\ \text{Å}, \ \angle C_3 - Ar = 90^\circ\). Its binding energy is about 130 cm\(^{-1}\) and the vdW stretch is 30 cm\(^{-1}\). The internal rotation of the complex is strongly coupled with the vdW stretch. Other conformers (two in-plane and one out-of-plane) have been identified as the C\(_3\) moiety of the complex bends away from the equilibrium angle. The computation results will be used to qualitatively interpret our experimental observations.