For fixed $n$, we seek an $n$-hedral tile of space of unit volume and least surface area. We provide a conjecture which lists our candidates from a certain irregular tetrahedron ($n = 4$) to Kelvin’s truncated octahedron ($n \geq 14$). We provide proofs of the conjecture for $n = 5, 4$. That a right equilateral-triangular prism is the best 5-hedral tile was known. However, there is only one published proof, which Florian calls “very troublesome” by Sucksdorff in 1857. We provide what we think is a nicer proof. The proof of the best orientation-preserving tetrahedral tile follows from a classification of tetrahedral tiles by Sommerville. (Received August 27, 2012)