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Non-Pyrolytic, Large-Scale Synthesis of Trichalcogenasumanene: A Two-Step Approach

‘Chalc’ing up a New Sumanene

Significance: Sumanenes are nanocarbon buckybowls with a six-membered benzene ring at their center. The authors report a new synthesis of sulfur- or selenium-substituted sumanenes from a triphenylene that avoids the very high temperature FVP methods (1000 °C) previously used. The new method employs much milder conditions and achieves much higher yields than the only other reported synthesis of trithiosumanene (K. Imamura et al. Chem. Commun. 1999, 1859), and also provides access to the previously unknown triselenasumanene.

Comment: The reported synthesis circumvents the challenge of simultaneous insertion of chalcogens into the bay positions of triphenylene by first accessing 1,2-dichalcogenin rings. These six-membered rings presumably have less ring strain than the monochalcogen rings and can be converted into the desired trichalcogenosumanenes by using copper powder in a solid-state reaction. This reaction can be performed on multi-gram scale.