For symposium AF1: Nanostructured semiconductor materials (the Gerischer Symposium)

Inorganic nanotubes and inorganic fullerene-like materials

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We have proposed that nanoparticles of layered compounds will be unstable against folding and close into fullerene-like structures and nanotubes (*IF*). Initially this hypothesis was realized in WS_2 and MoS_2. Subsequently, nanotubes and fullerene-like structures were prepared from numerous compounds of 2D habit. Much progress has been achieved in the synthesis of inorganic nanotubes and fullerene-like nanoparticles of metal dichalcogenides as well as with numerous other layered compounds over the last year or two.

In collaboration with L. Rapoport, it was formerly shown that addition of small amounts of *IF*-WS_2 to lubricating fluids largely improve their tribological characteristics. Major progress has been recently achieved in applying *IF*-WS_2 for self-lubricating matrixes. Various inorganic nanotubes are currently being investigated as potentially useful material for rechargeable batteries and hydrogen storage media. Catalytic application of MoS_2 nanotubes in methanation reaction has been also demonstrated. Potential applications of the inorganic nanotubes in various nanotechnologies and for sensorial devices will be discussed.