

## Building Carbon Bridges on and between Fullerenes in Helium Nanodroplets

### Content

We report the observation of sequential collisions of fullerenes with C atoms in an extremely cold environment. Experiments were performed inside helium droplets at 0.37 K doped with C<sub>60</sub> molecules and C atoms. Our results show that C-atom additions can transform a chemically inert fullerene C<sub>60</sub> into chemically reactive carbenes C<sub>60</sub>(C :)<sub>n</sub>.

Carbenes should play an important role in interstellar chemistry. Our experiments demonstrate the reactivity of C<sub>60</sub>(C :)<sub>n</sub>

toward H<sub>2</sub>, H<sub>2</sub>O, and another C<sub>60</sub>. We expect similar reactivities toward many other molecules as well as other carbenes such as :CO, :CS, :C<sub>n</sub>., :C<sub>n</sub>O, and :CNH. This opens the way toward a formation of a new class of fullerene derivatives in the interstellar medium.

### Summary

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