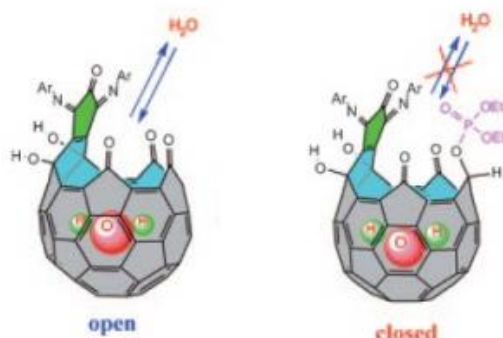


# Scientists build world's smallest 'water bottle'

19 November 2010, by Lisa Zyga



The tiny container could have applications in transporting small molecules or radioactive atoms for medical purposes and other uses.

**More information:** Qianyan Zhang, et al. "Switchable Open-Cage Fullerene for Water Encapsulation." *Angewandte Chemie*. DOI: [10.1002/anie.201004879](https://doi.org/10.1002/anie.201004879) via: [Nature](#)

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An open and closed fullerene cage holds a single molecule of water. Image credit: *Angewandte Chemie*.

Scientists have designed and built a container that holds just a single water molecule. The container consists of a fullerene cage and a phosphate moiety that acts as the "cap" to keep the water inside.

The researchers, Qianyan Zhang, et al., from institutes in Beijing and Germany, have published their study on the tiny [fullerene](#) cage in a recent issue of [Angewandte Chemie](#). While previous research has shown that fullerene cages can be used to surround molecules, here the chemists also designed a way to close (and re-open) the cage to let a water molecule in and out.

One of the keys was making the cap the exact size to allow a single water molecule to pass through, and modifying the classic carbon-60 form of fullerene accordingly. Due to its chemical properties, the [phosphate](#) moiety used for the cap can be easily removed and re-attached to the edge of an orifice in the fullerene cage, and can sufficiently lock a single water molecule inside.

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