

C₆₀F₁₇O.OH, the first fluorinated epoxyfullerenol

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Oxide derivatives frequently accompany formation of fluorinated fullerenes. Earlier work indicated that the derivatives obtained from C₆₀F₃₆ and C₇₀F_{36/38} and also from a mixture of fluorinated fullerenes were epoxides,¹ though it was not possible to confirm this. Compounds C₆₀F_xO.OH were also evident from mass spectrometry but no structures could be determined. Very recently the first epoxyfullerenols have been characterised.² The formation of fluorinated oxahomofullerenes (ethers) has also been fully demonstrated.³ Through irradiation of a toluene solution of C₆₀F₁₈ in air during 65 h we have now isolated the first fluorofullerene epoxyfullerenol, characterised it fully, and propose a general mechanism for the formation of epoxyfullerenols.

1. R. Taylor, G. J. Langley, J. H. Holloway, E. G. Hope, H. W. Kroto and D. R. M. Walton, *J. Chem. Soc., Chem. Commun.*, 1993, 875; R. Taylor, G. J. Langley, J. H. Holloway, E. G. Hope, A. K. Brisdon, H. W. Kroto and D. R. M. Walton, *J. Chem. Soc., Perkin Trans. 2*, 1995, 181; O. V. Boltalina, J. H. Holloway, E. G. Hope, J. M. Street and R. Taylor, *J. Chem. Soc., Perkin Trans. 2*, 1998, 1845; R. Taylor, A. K. Abdul-Sada, O. V. Boltalina and J. M Street, *J. Chem. Soc., Perkin Trans. 2*, 2000, 1013.
2. H. Al-Matar, P. B. Hitchcock, A. G. Avent and R. Taylor, *Chem. Commun*, 2000, 1071; H. Al-Matar, A. K. Abdul-Sada, A. G. Avent, P. W. Fowler, P. B. Hitchcock, K. M. Rogers and R. Taylor, *J. Chem. Soc., Perkin Trans. 2*, 2002, 53.
3. O. V. Boltalina, B. de La Vaissière, P. W. Fowler, P. B. Hitchcock, J. P. B. Sandall, P. A. Troshin, and R. Taylor, *Chem. Commun.*, 2000, 1325.