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The Use of Nearly Neat ¹⁶O¹⁸O in Spectroscopic Studies of Oxyhemerythrin and Oxyhemoglobin¹

In their interesting article on hemerythrin,2 Klotz and Kurtz mention the use of nearly neat 160180 in a resonance Raman spectroscopic study of the bonding of O2 in oxyhemerythyrin, citing unpublished work in a dissertation.³ Your readers may be interested to learn that a prior study of the O2 bonding in oxyhemoglobin was carried out with the same ¹⁶O¹⁸O sample, and led to a similar conclusion, i.e., that the O2 was bonded in such a way that the two oxygen atoms were not equivalent.4 To the best of our knowledge, this work constituted the first preparation of neat ¹⁶O¹⁸O and its first use in spectroscopy. The work represents a collaboration between the group at Northwestern and my group at Argonne National Laboratory, where the ¹⁶O¹⁸O was prepared by a rather laborious procedure that entailed the intermediate synthesis of ¹⁸O-enriched hypofluorous acid.⁵

We have subsequently developed a more convenient synthesis of nearly neat ¹⁶O¹⁸O that makes use of the recently isolated fluoroxysulfate ion, $^{6.7}$ SO₄F⁻, and we anticipate that this uniquely labeled oxygen molecule will now find application in a variety of spectroscopic measurements.

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- Based on work performed under the auspices of the Office of Energy Research, Division of Chemical Sciences, U.S. Department of Energy, under Contract W-31-109-Eng-38.
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