



ANASAZI NUCLEI SERIES

MULTINUCLEAR NMR FLUORINE-19

^{19}F PROPERTIES

- 100% natural abundance
- Spin $1/2$
- 800 ppm range of chemical shifts

DID YOU KNOW?

Henri Moissan, a French chemist, won the 1906 Nobel Prize in Chemistry for isolating elemental fluorine.

Fluorine chemistry flourished after WW2 because of the intense development of industries that provided fluorine and fluorinated materials to the Manhattan Project. Today, researchers exploit fluorine's unique characteristics to control the chemical and physical properties of an ever increasing diversity of materials—polymers, pharmaceuticals, agrochemicals, and semiconductors. Fluorine's ubiquity in advanced materials and its NMR friendly nature have positioned it among the most studied nuclei in NMR spectroscopy.

What can you do with ^{19}F NMR?

^{19}F NMR aids in characterizing the structure of fluorine containing compounds. It is a useful tool throughout a multi-step synthesis to characterize intermediates and target molecules. Fluorine couples to ^1H and ^{13}C , so J-coupling data provide connectivity insights.

The fluorine resonances of fluorinated compounds or fluorinated enzymes can be used to measure enzyme substrate interactions. Researchers use ^{19}F NMR to develop structure activity relationships (SAR) and hasten the drug discovery process.

^{19}F PROPERTIES

SPIN:	$1/2$	FREQ EFT-90:	84.687 MHz
RECEPTIVITY:	4730	FREQ EFT-60:	56.461 MHz
GYROMAGNETIC RATIO γ :	40.052 MHzT⁻¹	REFERENCE STANDARD:	CFCl_3

R.K. Harris et.al. *Pure Appl. Chem.*, Vol. 73, No. 11, 2001

RECOMMENDED LITERATURE

W.S. Brey & M.L. Brey. In *Encyclopedia of Nuclear Magnetic Resonance*, John Wiley & Sons, Inc., Chichester, 1996; Vol. 3, 2063-2071

J.-P. Bégué, D. Bonnet-Delphon, *Chimie Bioorganique et Médicale du Fluor*, EDP Sciences/ CNRS Éditions, Paris, 2005

W. R. Dolbier, *Guide to Fluorine NMR for Organic Chemists*, John Wiley & Sons, Inc., New York, 2009