

## ANASAZI NUCLEI SERIES

## MULTINUCLEAR NMR LITHIUM-6 \& 7

## ${ }^{6}$ Li PROPERTIES

- 7.42\% natural abundance
- Spin 1, quadrupolar
- Chemical shift range 25 ppm


## Li PROPERTIES

- 92.58\% natural abundance
- Spin 3/2, quadrupolar
- Chemical shift range 25 ppm


## DID YOU KNOW?

Some atomic weapons exploit the properties of the lithuim-6 nuclei. Because of the scale of industrial lithium-6 extraction, commercially available lithium is often enriched in lithium-7.

Lithium also has great utility in synthetic chemistry as part of organolithium reagents.
For example, the carbon nuclei in a lithium carbon bond is nucleophilic and can add across a double bond creating a new carbon-carbon bond. The 1963 Nobel Prize winning chemist Karl Ziegler was a key contributor to organolithium chemistry.
Lithium is now one of the best know elements due to the ubiquity of lithium-ion batteries. John B. Goodenough, M. Stanley Whittingham, and Akira Yoshino won the 2019 Nobel Proze in chemistry for their contributions to the development of rechargeable lithium-ion batteries.

## What can you do with ${ }^{6,7}$ Li NMR?

Study lithium ion solvation to optimize advanced inorganic materials for battery technologies. Measure $\left.{ }^{(6,7} \mathrm{Li}, \mathrm{X}\right)$ coupling constants to determine structure and connectivity of organolithium reagents.

## ${ }^{6}$ Li PROPERTIES

QUADRUPOLAR MOMENT: $\quad-0.0008 \times 10^{-28} \mathrm{~m}^{2}$
RECEPTIVITYTO ${ }^{13} \mathrm{C}: \quad 3.58$
GYROMAGNETIC RATIO $\gamma$ :
6.265 $\mathrm{MHzT}^{-1}$

FREQ EFT-90: 13.27 MHz
REFERENCE STANDARD: LiCl

## 7Li PROPERTIES

QUADRUPOLAR MOMENT: $\quad-0.045 \times 10^{-28} \mathrm{~m}^{2}$
RECEPTIVITYTO ${ }^{13}$ C: 1540 GYROMAGNETIC RATIO $\gamma$ :
16.546 $\mathrm{MHzT}^{-1}$ FREQ EFT-90: $\quad 35.04 \mathbf{M H z}$ REFERENCE STANDARD: LiCl
R.K. Harris et.al. Pure Appl. Chem., Vol. 73, No. 11, 2001

## RECOMMENDED LITERATURE

H. Günther in Encyclopedia of Nuclear

Magnetic Resonance, John Wiley \& Sons, Inc., Chichester, 1996; Vol. 5, 2807-2825.
C. Detellier in NMR of Newly Accessible Nuclei, Academic Press, New York, 1983; Vol. 2, 105-151

