

## Polarean 2770

$^{129}\text{Xe}$  Hyperpolarization Cartridge



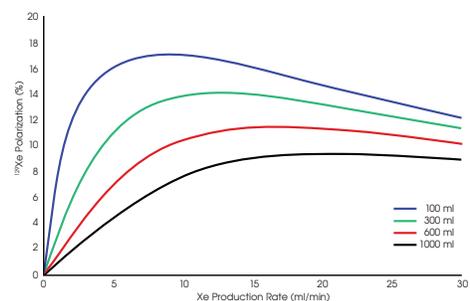
The 2770  $^{129}\text{Xe}$  hyperpolarization cartridge provides a path to convert an existing 9600  $^3\text{He}$  polarizer into a 9800  $^{129}\text{Xe}$  polarizer. The 2770  $^{129}\text{Xe}$  cartridge simply replaces the  $^3\text{He}$  cartridge in the polarizer, enabling it to generate a routine supply of high-purity, hyperpolarized  $^{129}\text{Xe}$  for gas phase magnetic resonance studies.

The  $^{129}\text{Xe}$  cartridge contains all the functionality needed to process mixtures of unpolarized  $^{129}\text{Xe}$ ,  $\text{N}_2$ , and  $^4\text{He}$ , into one or more doses of pure hyperpolarized  $^{129}\text{Xe}$ . It uses the same laser, optics and control electronics on the 9600 polarizer. As with hyperpolarization of  $^3\text{He}$ , there is no chemical change associated with

hyperpolarization - only nuclear spin alignment and cryogenic extraction of pure xenon. Hyperpolarized  $^{129}\text{Xe}$  is then thawed and dispensed into an appropriate container and used for imaging. Alternatively the gas can be maintained within a modest holding magnetic field where polarization decays with a relaxation time,  $T_1$ , of 1-2 hr.

### System Overview and Specifications

The upgraded hyperpolarization system can be operated on site by personnel who have undergone appropriate training.  $^{129}\text{Xe}$  polarization levels range over 7-15% depending on the volume of xenon processed. The upgraded system will continue operating as a Class I laser system, and thus requires no laser protective eyewear during normal operation.



*Note: The 9800 Xenon Hyperpolarization system is designed for research use. If the system is used to produce hyperpolarized  $^{129}\text{Xe}$  for human inhalation, all applicable institutional and federal approvals must be obtained.*

### Xenon Cartridge Components

- Mass flow and pressure readings
- High-field cryogenic accumulation area
- Shielded optical oven with temperature control
- Flow-through optical cell containing Rb metal
- Safety interlocks

### Safety Features

- Designed and built to the standards of a 9800 hyperpolarizer, which has CE Mark, UL and CSA approval
- DOT approved shipping of replacement optical cells

### Optional Equipment and Services

- $^{129}\text{Xe}$  cylinder manifold for connecting xenon mixture, UHP  $\text{N}_2$ , and commercial  $\text{N}_2$  tanks
- On-site installation and training
- Training services at Polarean
- Regulatory affairs support

### Cartridge Dimensions

- 59cm L x 48cm W x 104cm H
- (23" L x 19" W x 41" H)

### Laboratory Space Requirements

- Wall-mount tank rack capable of securing three (3) compressed gas cylinders

### Supplies and Consumables

- External  $^{129}\text{Xe}$ - $^4\text{He}$ - $\text{N}_2$  tank
- External UHP  $\text{N}_2$  tank
- External commercial  $\text{N}_2$  tank
- Liquid nitrogen
- Liquid nitrogen transfer dewar
- Dose delivery bags