

OXYCAPT™ Multilayer Plastic Vial

for Biologics & Cell Gene Therapy Products

CO₂ Permeation after Freezing & Thawing

Sample

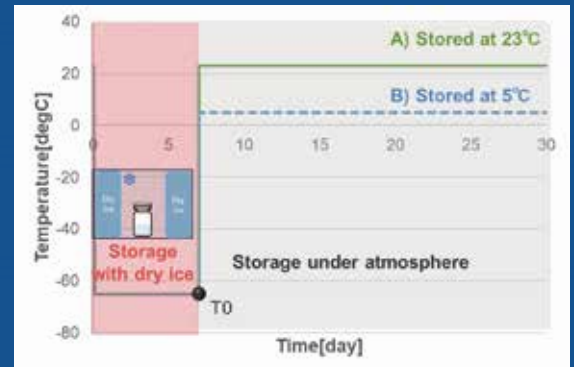
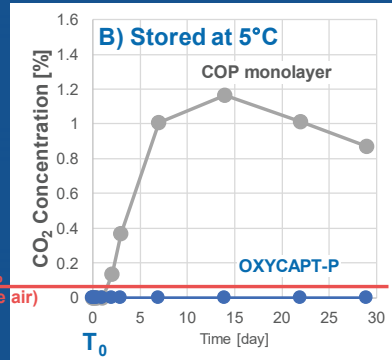
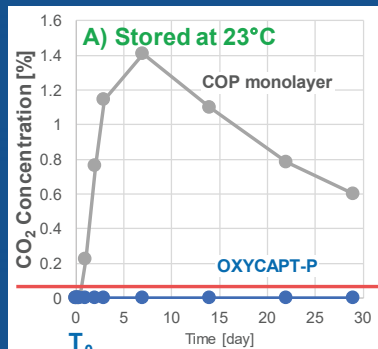
Entry	Vial	Closure	Quantity (for each condition)
1	OXYCAPT-P (10mL)	BBR + Aluminum Cap	5
2	COP (10mL)	BBR + Aluminum Cap	5

Procedure

Each vial was;

- 1) filled with N₂ in chamber.
- 2) sealed with BBR & AL cap by auto-crimper
- 3) put into insulation box with dry ice and stored for 7 days.
- 4) taken out and stored at 23 or 5°C.
- 5) measured with CO₂ analyzer at each time point.

Result



Theory of CO₂ Permeation

There are 2 phenomena of gas molecule permeation through plastics;

A) Dissolution

B) Diffusion

	-80°C (Storage)	23°C (Thawing)	23°C (Before Injection)
Dissolution	Higher	Lower	
Diffusion	Slower	Faster	
	<p>Step 1: Dissolution</p>	<p>Step 2: Diffusion</p>	<p>CO₂ Permeation</p>

Permiation Scheme

$$P = P_0 \exp\left(-\frac{E_p}{RT}\right)$$

$$P = S \cdot D$$

S : Solubility coefficient
 D : Diffusion coefficient
 P : Permeability coefficient

T : Temperature