

**Table 1.** The comparison of swelling, porosity, pore volume, and gel yield% values of super porous p(NIPAM), and  $\alpha$ -Glu@p(NIPAM) cryogel systems.

Cryogel	Swelling %		Porosity %		Pore volume %		Gel yield %
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	
P(NIPAM)	1127±98	352±29	79.2±1.9	47.3±2.1	83.1±3.7	50.8±2.1	95.1±0.9
*@p(NIPAM)-0.5	1116±112	353±34	78.7±1.4	45.6±3.1	80.6±2.5	48.2±3.2	94.3±1.9
*@p(NIPAM)-1	1104±94	348±33	79.7±2.1	46.8±1.6	81.8±2.8	49.5±1.3	93.7±1.4
*@p(NIPAM)-2	1111±126	324±49	77.3±2.7	46.1±1.7	81.3±1.5	50.1±1.8	93.9±1.8

\*0.5, 1.0, 2.0 mg  $\alpha$ -Glu enzyme/g of cryogels are denoted as @p(NIPAM)-0.5, @p(NIPAM)-1, and @p(NIPAM)-2, respectively.

**Table 2.** The leakage% of enzymes from relevant  $\alpha$ -Glu@p(NIPAM) cryogel systems with multiple DD washing procedure.

Cryogel	Leakage% of enzyme		
	I. washing	II. washing	III. washing
$\alpha$ -Glu@p(NIPAM)-0.5	6.8±0.6	3.1±0.2	0.6±0.1
$\alpha$ -Glu@p(NIPAM)-1	9.3±0.5	5.2±0.3	0.5±0.1
$\alpha$ -Glu@p(NIPAM)-2	15.1±0.8	11.7±0.3	0.9±0.1

**Table 3.** The immobilization yield, immobilization efficiency, and activity recovery% values for  $\alpha$ -Glu@p(NIPAM) cryogel systems with the respect to their free enzyme amounts.

Cryogel	Immobilization yield%	Immobilization efficiency %	Activity Recovery %
$\alpha$ -Glu@p(NIPAM)-0.5	89.4±3.1	66.2±3.3	74.0±3.3
$\alpha$ -Glu@p(NIPAM)-1	84.9±2.2	57.4±0.9	67.5±0.9
$\alpha$ -Glu@p(NIPAM)-2	72.3±5.3	40.7±1.1	56.3±1.1

**Table 4.** The comparison of kinetic parameters of  $\alpha$ -Glu@p(NIPAM)-0.5 cryogel systems with the equal amount of free enzyme at 25 and 37 °C at pH 6.8.

Plots	Parameters	25 °C	37 °C
		Free $\alpha$ -Glu	$\alpha$ -Glu@p(NIPAM)-0.5
Linear	$K_m$ (mM)	1.34±0.03	1.07±0.02
	$V_{max}$ (mM/min)	0.004±0.0003	0.002±0.0002
Non-linear	$K_m$ (mM)	1.48±0.02	1.10±0.01
	$V_{max}$ (mM/min)	0.010±0.005	0.002±0.0001