

**Summary Report of Experiments Investigating the Sorption and  
Desorption of Benzene to EC-199**

**Prepared By**

**Vinka Craver, Ph.D.**

**and**

**James Smith, Ph.D.**

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**For**

**George Alther**

**Biomin, Inc.**

**P. O. Box 20028**

**Ferndale, MI 48220**

This report presents data summarizing the results from a column experiment studying the sorptive capacity of EC-199 to an aqueous-benzene solution. A 13-inch long (33.1 cm) by 1.5-inch diameter (3.8 cm) glass column was used and filled with the sorbent material to be studied. A peristaltic pump forced an aqueous solution containing 860 mg/L of benzene through the column.

After the sorption phase was complete, a desorption test was carried out. Water without any organic compound was fed to the column instead of the aqueous-benzene solution.

After the desorption test with an organic-free water solution, a second desorption test was carried out using a 420 mg/L aqueous-toluene solution.

Samples were collected periodically at the outflow of the column and analyzed using gas chromatography with a flame ionization detector.

**Table 1.** Sorbent mass, porosity, flowrate and residence time information for the EC-199 column experiments.

Sorbent	Mass Sorbent		Porosity	Flow Rate		Residence (min)
	(kg)	(lb)		(mL/min)	(gal/hr)	
EC-199	0.121	0.242	0.4	7.5	0.121	20

**Table 2.** 95% breakthrough for the EC-199 given in pore volumes and minutes along with estimated mass of benzene sorbed per mass of sorbent in mg/kg, lb/lb and percent basis.

Sorbent	Breakthrough			Mass sorbed		Mass Sorbed/Mass Sorbent		
	PV	BV	min	(mg)	(lb)	(mg/kg)	(lb/lb)	(% by sorbent)
EC-199	150	60	3000	11814	0.026	96050	0.096	9.07

**Table 3.** Desorption of benzene from a column of EC-199 given in pore volume, bed volume and minutes along with the estimated desorbed mass

Sorbent	Time			Mass desorbed		
	PV	BV	min	(mg)	(lb)	(mass desorbed/mass sorbed)
EC-199	69.4	27.4	1915	2463	0.0054	0.21

**Table 4.** Desorption of benzene from a column of EC-199, using an aqueous-toluene solution, given in pore volume, bed volume and minutes along with the estimated desorbed mass

Sorbent	Time			Mass desorbed		
	PV	BV	min	(mg)	(lb)	(mass desorbed/mass sorbed)
EC-199	75.9	30.4	2095	175.89	0.0004	0.02

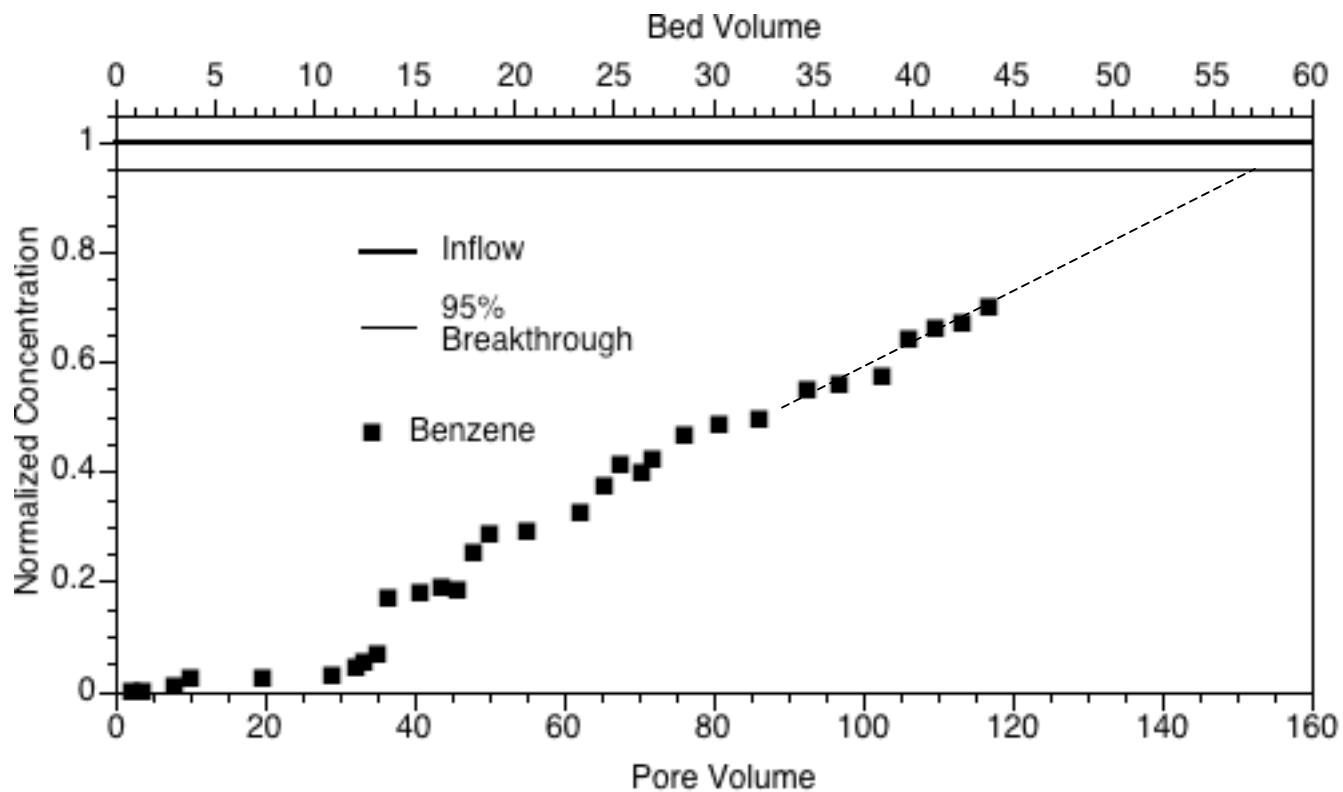


Figure 1. Breakthrough curve of benzene through a column of EC-199

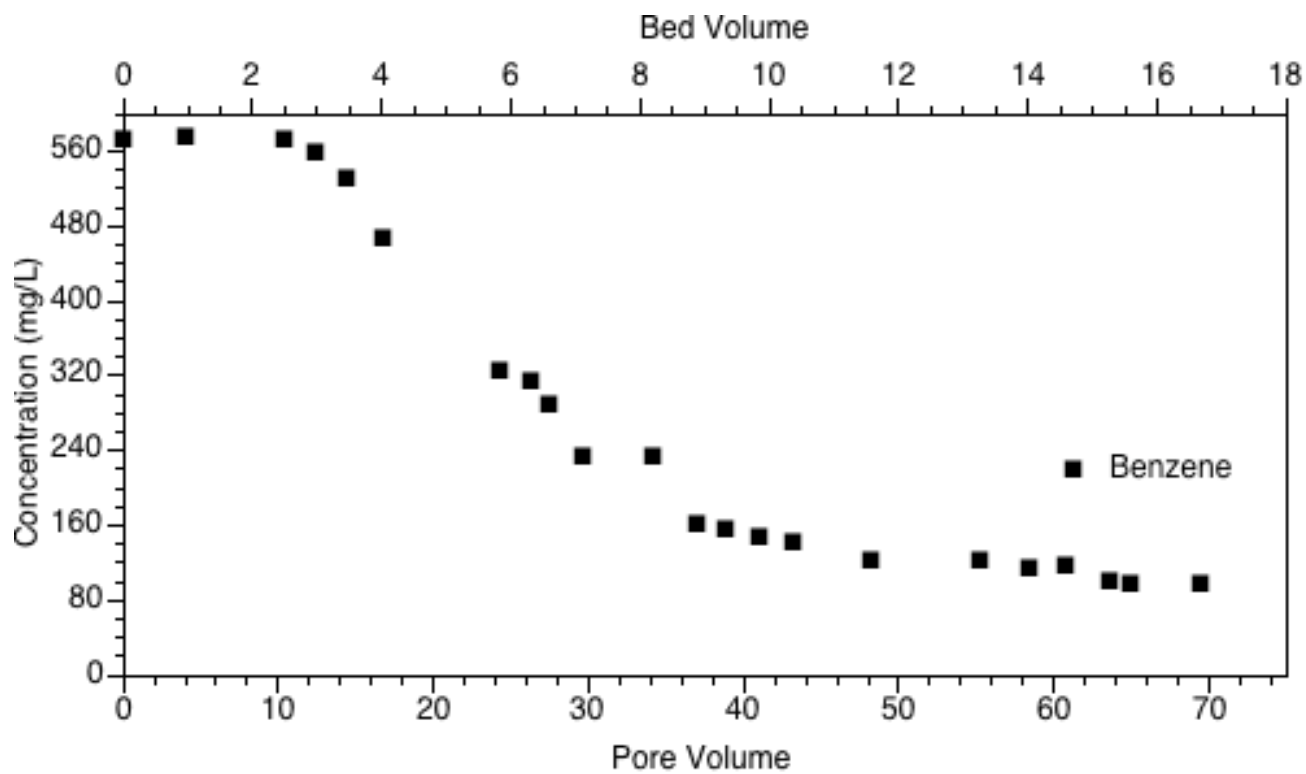
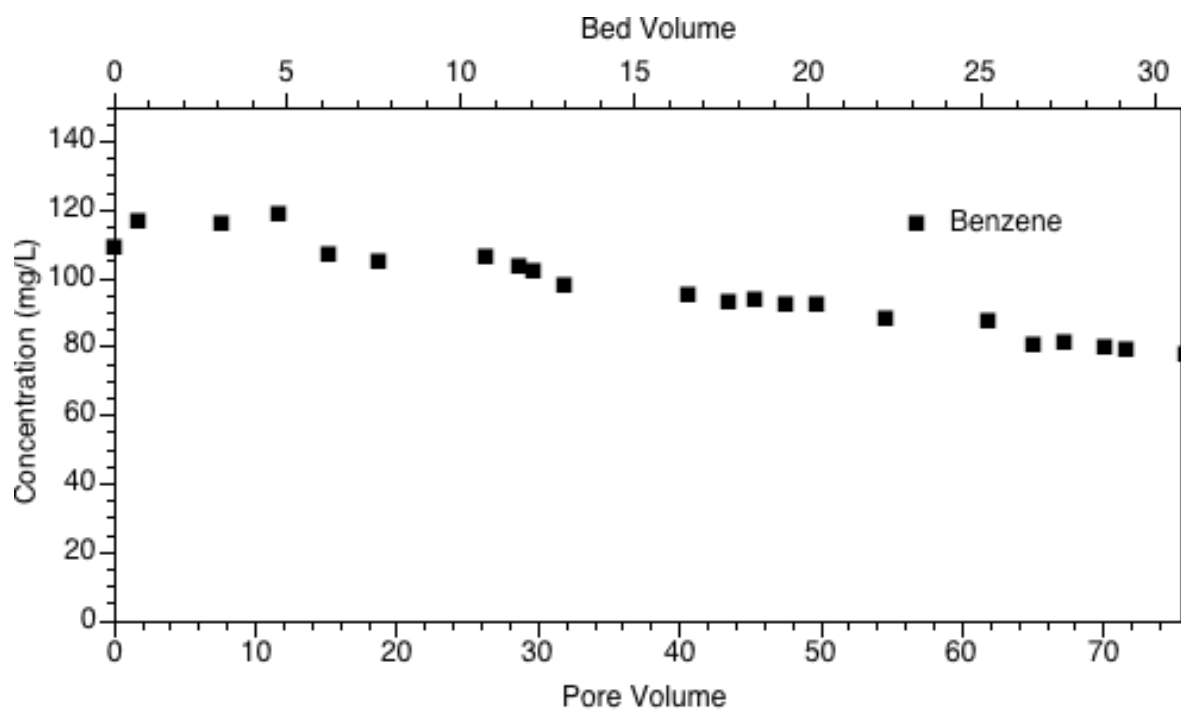


Figure 2. Desorption of benzene from a column of EC-199



**Figure 3.** Desorption of benzene from a column of EC-199 using an aqueous-toluene solution