Summary Report of Experiments Investigating the Sorption of Vegetable Oil on Two Sorbents

Prepared By

Vinka Craver, Ph.D.

and

James Smith, Ph.D.

November 3, 2005

For

George Alther

Biomin, Inc.

P. O. Box 20028

Ferndale, MI 48220

This report presents Tables and Figures summarizing the results from two column experiments studying the sorptive capacity of Economy oilsorb, and Oilsorb to an aqueous-vegetable oil solution. A 12-inch long (30 cm) by 1.5-inch diameter (3.8 cm) glass column was used for the Oilsorb test, while a 30-inch long (76.2 cm) by 3-inch diameter (7.62 cm) column constructed from poly-vinyl-chloride (PVC) was used for the Economy oilsorb test. A peristaltic pump forced an aqueous-vegetable oil solution containing between 1200 to 1900 mg/L vegetable oil up through the column to displace void-space air and ensure maximum contact with the sorbent material. Samples were collected periodically at the outflow of the column and analyzed using a COD method.

Results in this report are presented in Tables 1 and 2 and in Figures 1 to 7 as identified below:

Table 1. Sorbent mass, porosity, flow rate, and residence time information for the two column experiments.

Table 2. 95% breakthrough for the three two given in pore volumes (PV), bed volumes (BV), and minutes along with estimated mass of vegetable oil sorbed per mass of sorbent in mg/kg, lb/lb and percent basis.

Figure 1. Breakthrough curve of vegetable oil through a column of Economic Oilsorb.

Figure 2. Breakthrough curve of oil through a column of Oilsorb.

Figure 3. Comparison of breakthrough curves of oil through the two sorbents

Table 1. Sorbent mass, porosity, flow rate, and residence time information for the two column experiments.

Sorbent	Mass Sorbent		Porosity	Flow Rate		Residence
	(kg)	(lb)		(mL/min)	(gal/hr)	(min)
Economic Oilsorb	2.24	4.9	0.34	60	0.97	20
Oilsorb	0.13	0.3	0.29	14.3	0.23	7.9

Table 2. 95% breakthrough for the two sorbents given in pore volumes (PV), bed volumes (BV), and minutes along with estimated mass of vegetable oil sorbed per mass of sorbent in mg/kg, lb/lb and percent basis.

Sorbent	Breakthrough			Mass sorbed		Mass Sorbed/Mass Sorbent		
	PV	BV	min	(g)	(lb)	(g/kg)	(lb/lb)	(% by sorbent)
Economic Oilsorb	576	196	11520	671	1.5	299	0.3	29.9
Oilsorb	1150	334	9085	65.8	0.14	506	0.5	50.6

.

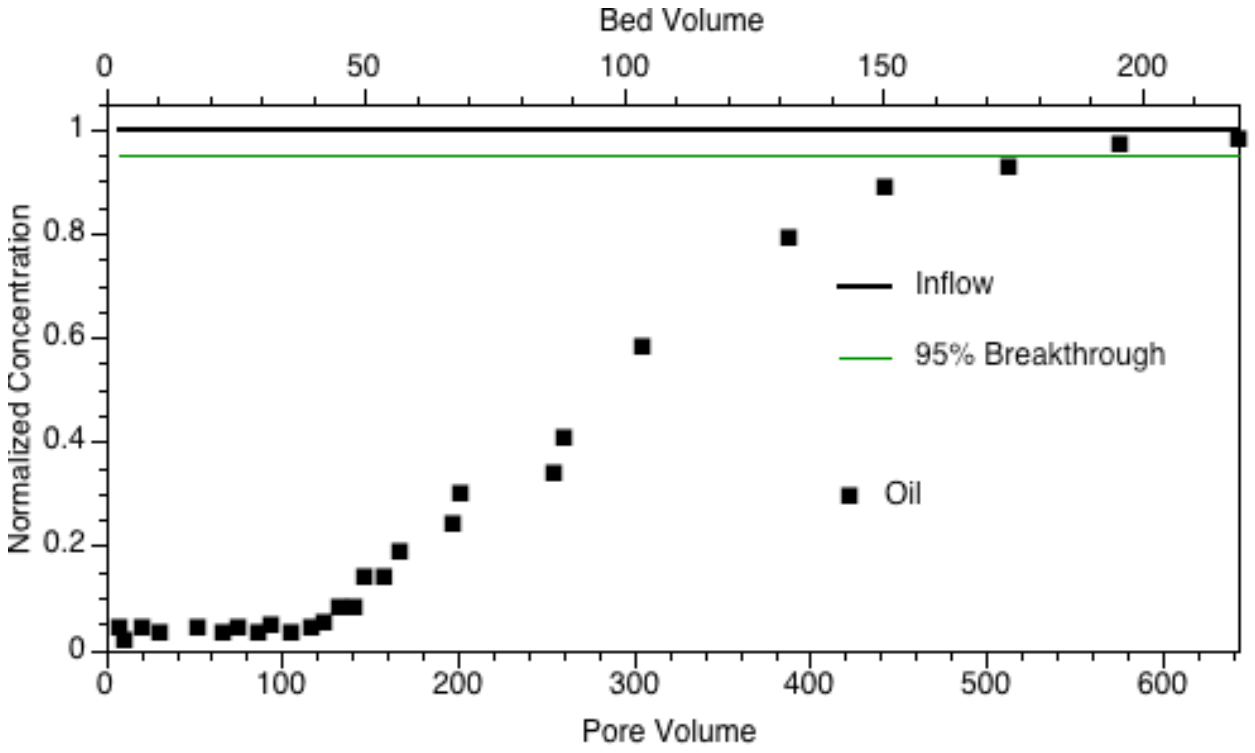

Figure 1. Breakthrough curve of vegetable oil through a column of Economic Oilsorb.

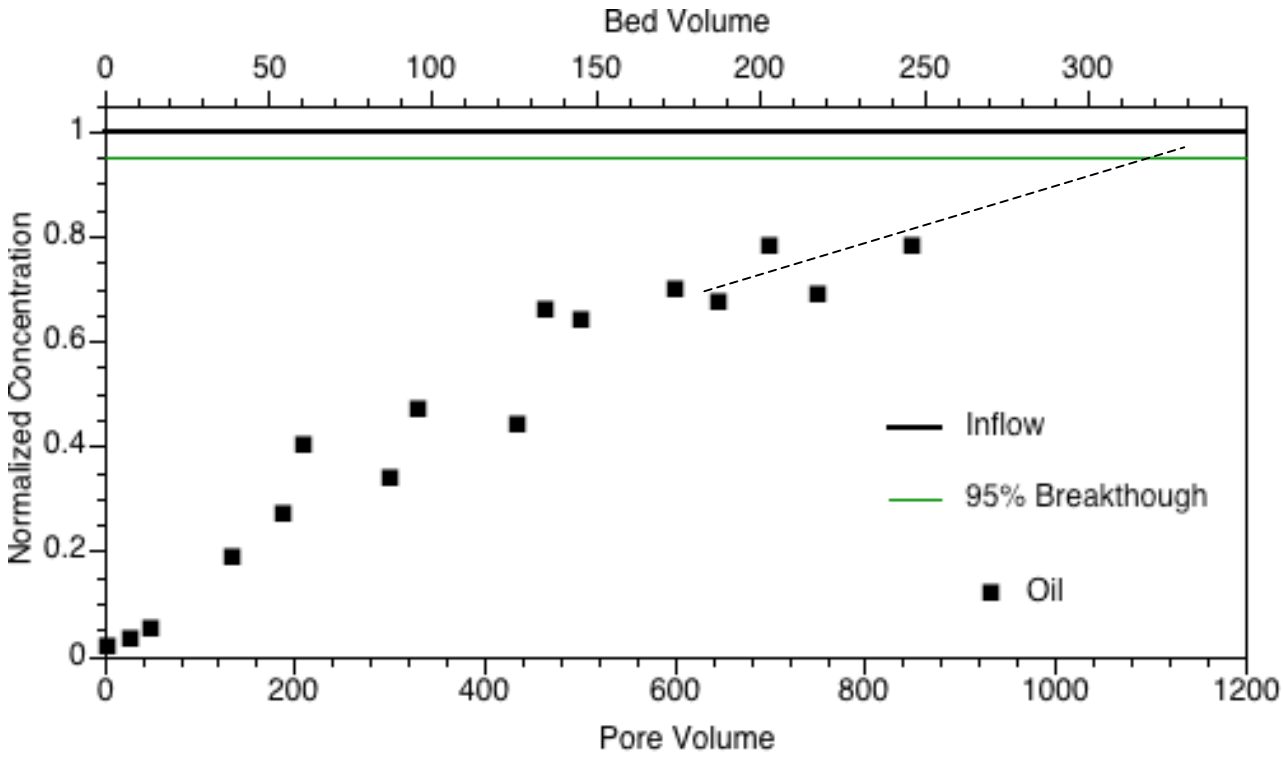

Figure 2. Breakthrough curve of oil through a column of Oilsorb.

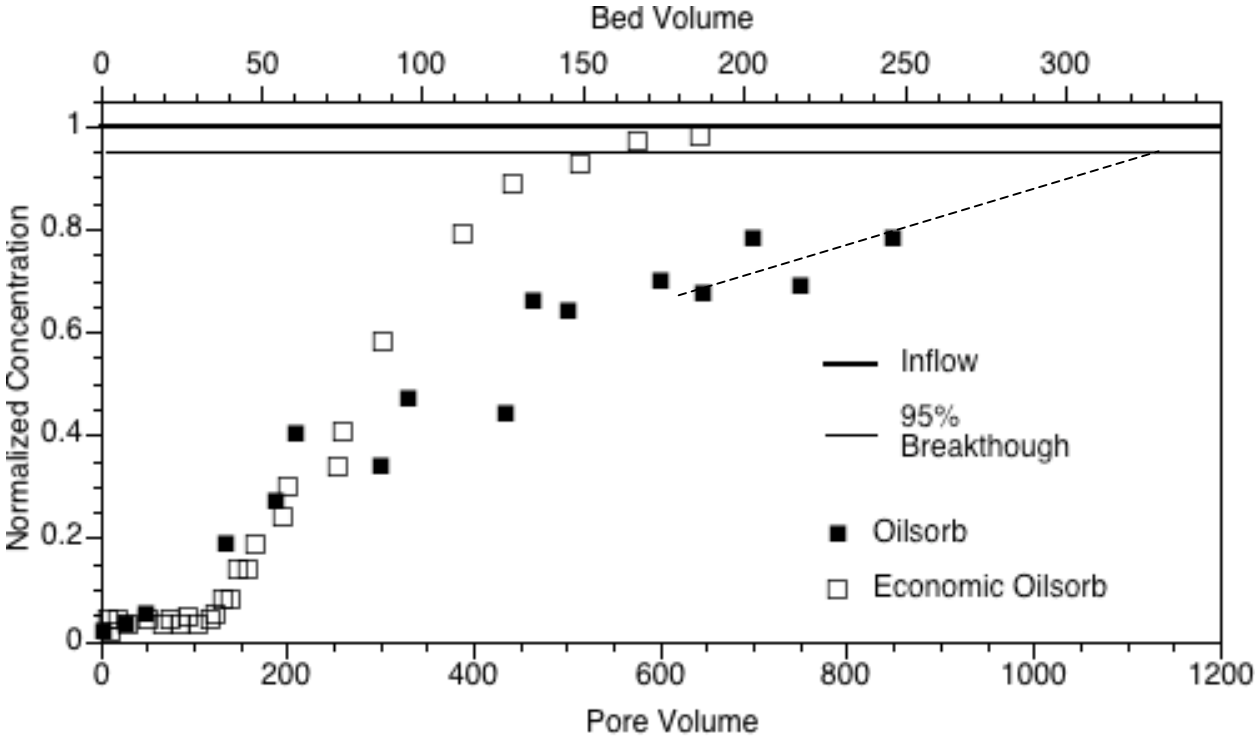

Figure 3. Comparison of breakthrough curves of oil through the two sorbents