

**Summary Report of Experiments Investigating the Sorption of
Dimethyl Sulfide Vapor to EC-199**

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For

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This report presents data on the sorption of dimethyl sulfide (DMS) vapors from humidified air to EC-199 sorbent. In addition, DMS data is compared to previously collected data for two other vapors (dimethyl disulfide [DMDS] and benzene). 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. The gas stream containing DMS vapors was prepared by flow air into two glass columns (in parallel) filled with glass beads, one containing water, and the other pure DMS. Effluent gas flows from the columns were saturated with water vapor and DMS vapor, respectively. Relative humidity and DMS vapor concentrations were maintained at 75% and 25% of saturation based on the relative flow rates through the two pre-columns. Based on the temperature in the laboratory, 25% of DMS vapor saturation corresponds to about 338 mg/L. Air flow applied to each column was controlled using gas mass-flow controllers. Air samples were collected periodically at the outflow of the column and analyzed using gas chromatography with a flame ionization detector. Results in this report are presented below.

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	0.12	0.27	0.3*	42.3	0.67	2.7

*Determined in previous tests

Table 2. 95% breakthrough for the DMS, DMDS, and benzene vapors through EC-199 given in pore volumes and minutes along with estimated mass of vapor 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)
DMS	817	245	2534	13281	0.034	127437	0.127	12.74
DMDS	3444	1033	10670	16081	0.035	146197	0.146	14.62
Benzene	1094	328	3391	10283	0.023	102834	0.103	10.28

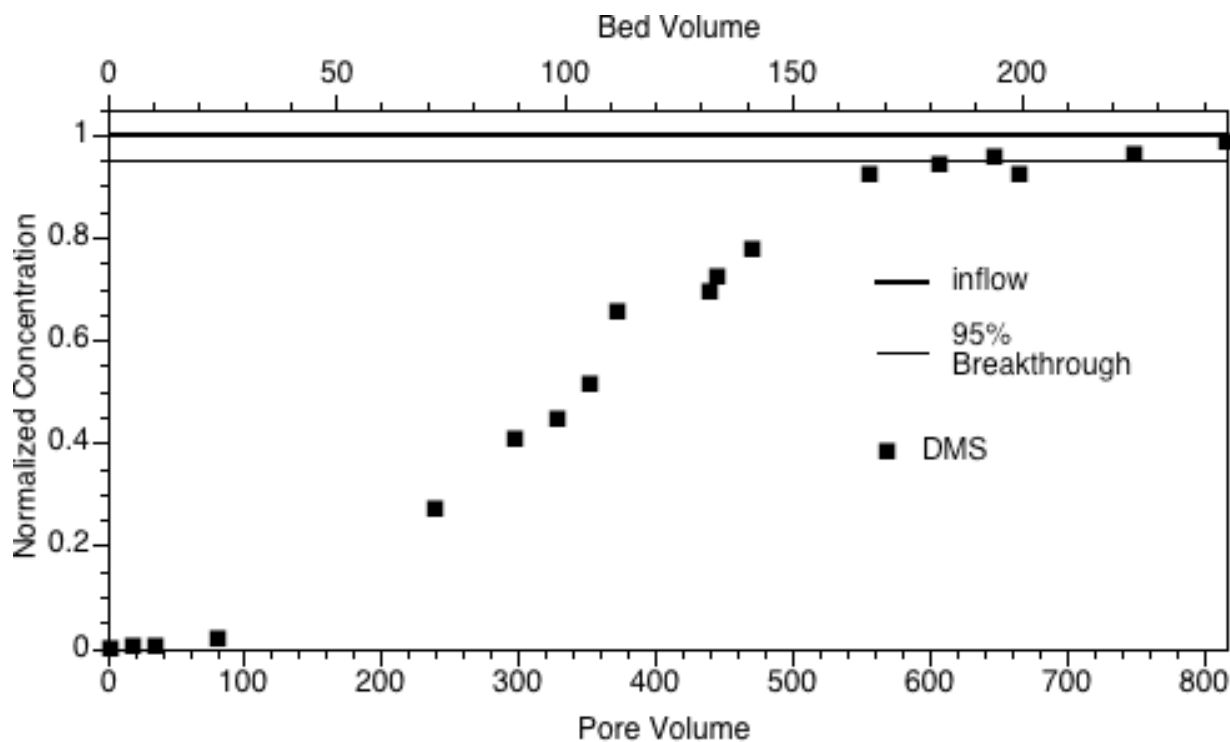


Figure 1. Breakthrough curve of DMS vapor through a column of EC-199

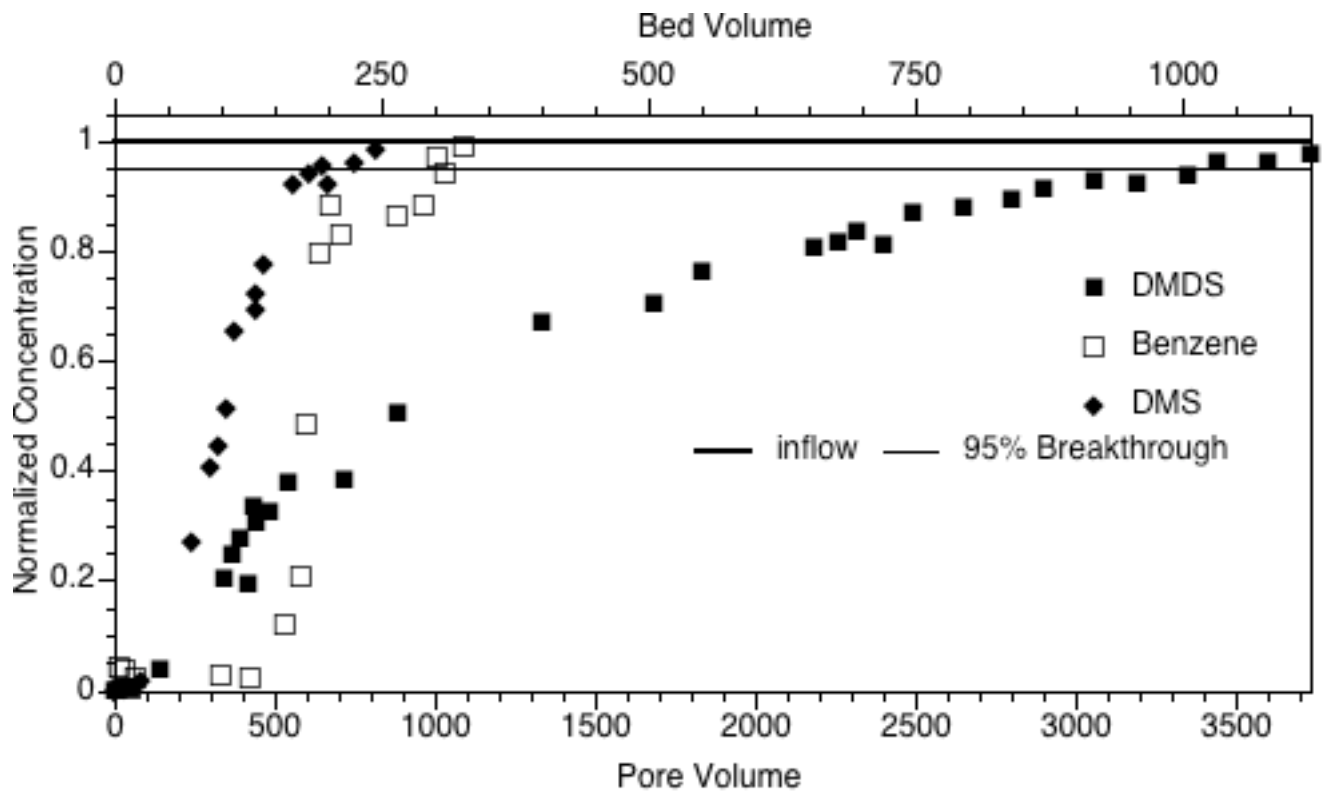


Figure 2. Comparison of the breakthrough curve of DMS, DMDS and benzene vapor through a column of EC-199