

k=0.14

Figure 1. Plot of amount of dissolved oxygen with respect to time (Second Order Reaction)



k=.3

Figure 2: Plot of amount of dissolved oxygen with respect to time (Zero Order Reaction)



k=0.11

Figure 3: Plot of amount of dissolved oxygen with respect to time (First Order Reaction)

**Memorandum**

To: Co-Worker

From: Your Co-Worker (Conor)

Date: 9/24/13

Objective:

The objective of our firm was to design a process to remove chlordane from a water treatment plant in Iowa. To do this, we had to determine an efficient method to reduce the concentrations of chlordane in the water to reduce to below 2 ppb, the maximum contaminant level of chlordane. The firm wanted to use granulated activated carbon (GAC) to accomplish this task. Therefore it was our goal to define the parameters for the sorption isotherm of chlordane on GAC.

Method:

After you performed the laboratory study was performed and collected the data, I fit the data to the Freundlich sorption isotherm. I fit the data to the Freundlich sorption isotherm by plotting the dissolved chlordane concentration, C*aq* (mg/L) against the adsorbed chlordane concentration, C*adsorbed* (mg/ [g GAC]). Then using both Eq. 5 (Linear) and Eq. 6 (Freundlich), I determined that the Freundlich was the better fit to the data than the linear.

(5)

(6)

Results and Discussion:

After fitting the plotted data to both the Linear sorption isotherm and the Freundlich sorption isotherm, I visually analyzed the data. From this, my results yield that the Freundlich sorption isotherm matches the data better than the linear sorption isotherm. Although I have not generated proper statistical tests for goodness of fit, the visual test sufficed because of the marginal difference between the two models. Using Eq. (6) I determined that the Freundlich isotherm soil-water partition coefficient to be 245 (mg/g)(L/mg). Furthermore I solved for the unit-less Freundlich isotherm intensity parameter and yielded 0.4.



Adsorbed Chlordane Concentration (mg/[g GAC])

Dissolved Chlordane Concentration (mg/L)

K=245

1/n=.4

Figure 1: Plot of dissolved chlordane concentration (mg/L) against adsorbed chlordane concentration (mg/[g GAC]).