Kinetics Lab

Deborah Sills

August 14, 2013

1 Sorption

The influent water to a drinking water plant in Ames Iowa is contaminated with the pesticide chlordane. The plant operator has contracted the firm you work for to design a process to remove chlordane. The firm is considering designing a treatment process that uses granulated activated carbon (GAC).

You are part of a team that has been asked to asses whether treating the water with GAC will reduce chlordane concentrations sufficiently.

Your boss has asked you and the other new engineer to conduct a set of experiments to determine the parameters for the sorption isotherm of chlordane on GAC. The model parameters will be used to design a bench-scale treatment unit.

Your colleague has collected the data, and you have been asked to fit the data to the equation that describes the Freundlich isotherm and to report the parameters of the model.

You need to report the parameters to Mr. Hayes in a short memo that includes the following sections: objective, methods, results (present your figures) and discussion. Since this is a preliminary laboratory study you do not need to include introduction and conclusion sections.

2 Aeration

Bioprocess Algae is designing a system to deliver CO_2 to their new raceway ponds used to grow microalgae. They have asked you to conduct a laboratory study that will determine the effect of three following designs on the rate of CO_2 input into the ponds: (1) mixing only, (2) CO_2 gas delivery with a small diameter diffuser (D = 4 um), and (3) CO_2 gas delivery with a large diameter diffuser (D = 8 cm).