

CE/ESR 479/579

Things to Know for the Final Exam

(Key Concepts for Your Understanding)

- ' The difference between plug flow and advective-diffusive (or dispersive) flow
- ' Know how to use the solutions to some of the simple advection-dispersion problems we have gone over (such as calculating the concentration curve or C_{\max} after a point source, instantaneous injection into a river or in a 1-D groundwater situation, such as a sand column experiment).
- ' Know the ways in which Michaelis-Menten enzyme kinetics are similar to and are different from Monod growth kinetics.
- ' Know how to spell "Menten"
- ' Be able to set up and use simple hydrolysis rate expressions including acid-catalyzed and base-catalyzed hydrolysis. (I don't expect you to know the molecular mechanisms of hydrolysis but I expect you to know how to use the various types of hydrolysis rate constants).
- ' Be able to make a simple approximation of photolytic degradation of an organic compound. (And be sure to recall the test discussion of ways of estimating indirect photolysis).
- ' Know the major, common identifying characteristics of oxic and anoxic environments.
- ' If given appropriate information, calculate the rate of uptake or excretion of a chemical by an organism.
- ' Know how and when to use a partitioning bioconcentration factor.
- ' Know how and when to use a kinetic (uptake/excretion) bioaccumulation factor.
- ' Know Darcy's Law and how to use it in a simple problem.
- ' Be able to roughly estimate a hydraulic conductivity for a given porous medium.
- ' Flow nets: know the general features, construction and interpretation
- ' Know how to calculate and use retardation factors for a porous medium if given partitioning parameters and physical properties of the medium. (Also, be able to use what we learned earlier in class about K_{ow} , K_{oc} , and K_p to be able to work up a retardation factor starting from just K_{ow} data)
- ' Be able to interpret and explain the basic characteristics of a groundwater breakthrough curve.
- ' Know the simple rules for estimating dispersion coefficients in an aquifer

Finally, brush up on stuff from early in the term that kept cropping up later in the term.