

## Geology 334: HOMEWORK 3

### Short-Answer Questions on Lecture Material

Due Date: Thursday April 25, 2019

This homework is intended to check your understanding of some of the material that we've covered in class so far. It also gives you an idea of the types of questions that I'm likely to ask on the midterm exam. Feel free to use all information in your notes and text, but be sure to put answers into your own words that reflect *your* understanding. Answer the following questions on a separate sheet(s) of paper, typed or neatly hand-written (or a combination of both).

- (A) Write out the chemical reaction for dissolution of calcite, with calcite on the left side and the dissolved products on the right side of the equation. Label all the components.

(B) Explain concisely how changes in CO<sub>2</sub> concentration cause the reaction to shift toward more dissolution or more precipitation. Indicate the direction of the change in the reaction.
- (A) Define the term quartzarenite. Show this composition on a QFL diagram.

(B) How are quartzarenites forming in the Orinoco River system today, and how does this differ from the traditional view (conventional wisdom) on the origin of quartzarenites?
- (A) Show the behavior of a non-Newtonian fluid on an X-Y plot of velocity gradient ( $du/dy$ , on the y-axis) as a function of applied shear stress ( $\tau$ , x-axis).

(B) Describe this behavior with words; please include a complete definition of a fluid.
- (A) What is the Keeling Curve? (find it at the course website) What is it based on (i.e. what are the main data and observations), and what range of time does it cover?

(B) What data provide compelling evidence that the rise in atmospheric CO<sub>2</sub> concentration since ca. 1900 is not just the result of "natural" variations in Earth's climate system?
- (A) Briefly define hydrolysis, as we did in class.

(B) Write out an example of a common hydrolysis reaction, making sure to include and label all the main components of the reaction.