

**Petroleum Geology ta3820 Written
Examination, November 2,2006**

Prof. Dr. Stefan M. Luthi

The following questions should be answered as concisely as possible (this is part of the rating). Please mention your name and student number at the top of each sheet.

1. Explain in written the major steps in the carbon cycle, both organic as well as inorganic. *Use* chemical formulas if needed. At what point does fossilization *of* organic matter *occur*?
2. Make a diagram in which the boiling point *or* the hydrocarbon grade is shown *on* the horizontal, and the percentage *on* the vertical axis. Now plot the major hydrocarbon groups as separating fields *onto* this diagram *for* an oil *of* your choice - but whose characteristics you should mention.
3. A source rock is 12 meters thick and 8 by 8 kilometers in lateral extent. Measurements *of* the TOC indicate it to be in the middle *of* the "good source rock" range, with *one* third converted into mature hydrocarbons. In primary migration 25% of them *ge*expulsed, but in secondary migration one fourth gets lost. How much hydrocarbon (in m³) finds its way to the accumulation?
4. We looked at some typical reservoir rocks in the lecture. Discuss the main characteristics that were evident between the carbonate and the sandstone samples. Explain where these differences come *from*.
5. Explain the trap types *of* the Iranian oil fields in the Zagros Mountain range and why they are difficult to find *from* the surface. Make an explanatory sketch *for* clarity.