

GEOL6550 Clay Mineralogy - Final exam – Spring 2004

Please prepare responses to the following questions. Use any resource (*i.e.*, open book) and work independently. **Due under my door (room 329) Wednesday, May 5th at 5 PM.**

1. The attached figure contains a Co K α diffractogram of an oriented <2 μ m mount. The sample is in a Ca and ethylene glycol saturated state. Identify the phase(s) present. Discuss the basis for your interpretation.
2. Outline the procedure for recasting the chemical analysis of a clay mineral into a structural formula. Discuss the potential problems with normative procedures and approaches one might use to resolve ambiguities. What mineral group is represented by the chemical analysis below?

| Oxide | Wt. % |
|--------------------------------|-------|
| SiO ₂ | 42.02 |
| Al ₂ O ₃ | 0.52 |
| TiO ₂ | 0.00 |
| Fe ₂ O ₃ | 0.19 |
| FeO | 0.11 |
| MnO | 0.03 |
| MgO | 41.44 |
| CaO | 0.00 |
| Na ₂ O | 0.00 |
| K ₂ O | 0.00 |
| H ₂ O ⁺ | 14.04 |

3. Select a relatively recent article from one of the following three journals (1) *Clays and Clay Minerals*, (2) *Clay Minerals*, or (3) *Applied Clay Minerals*. Read the article and abstract the following information. (a) What was the objective(s) of the study? (b) What methods were employed? (c) What were the significant results? (d) What were the major conclusions of the study? (e) Critically comment on the interpretations of the authors. (f) What would you have done differently or what study would you propose to do next?

