The American University of Beirut
Final Examination

Crystallography/Mineralogy (211)
Department of Geology
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June 23, 1998
Time: 2 hours
Exam rules apply

Part I

Answer all questions in Part I

(MARKS)

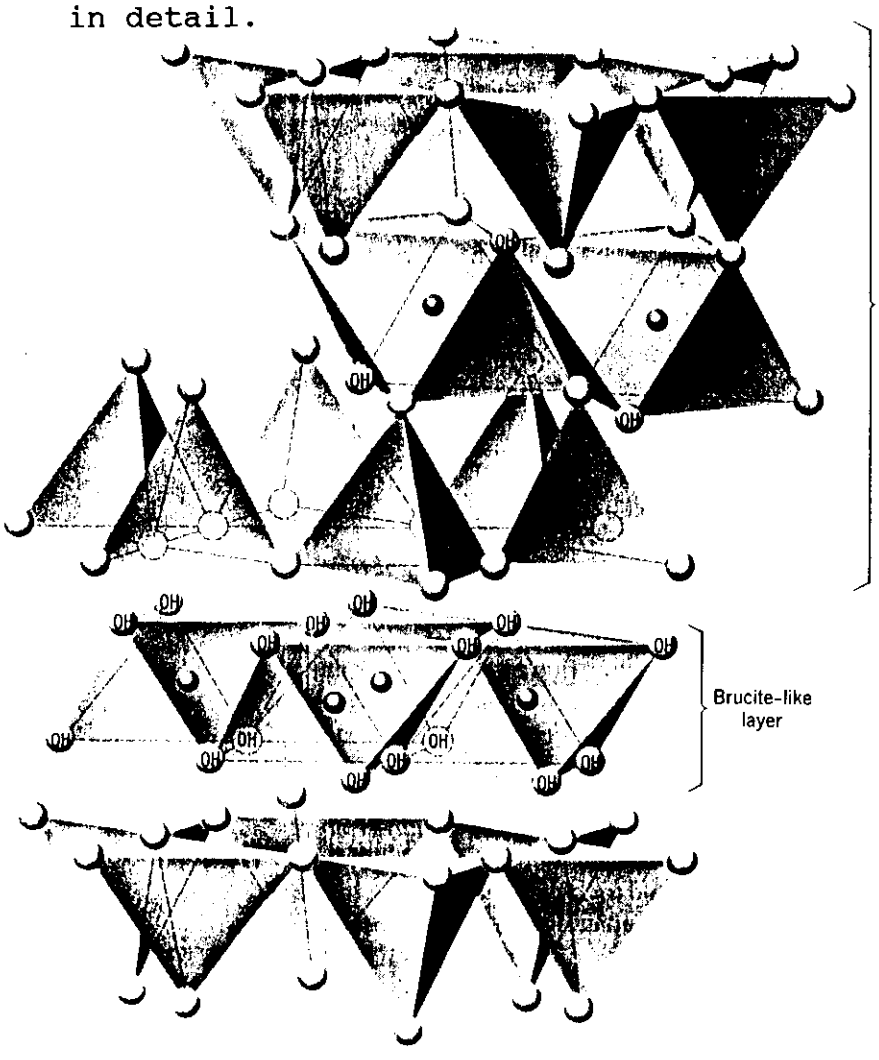
(20) 1. (a) Describe the so-called "Biopyriboles", and give a mineralogical example.

(b) How do pyroxenoids differ from pyroxenes; name a pyroxenoid mineral, and give its composition.

(c) Zeolites have been used for a number of applications; Discuss one of these applications, with emphasis on the role of substitution.

(d) Give the general formula of a dioctahedral mica, and of a trioctahedral mica, and give the coordination number of the various structural sites in the formulae.

(e) Given below is a diagrammatic sketch of the structure of chlorite. Describe this structure in detail.



(10) 2. Concisely describe the structure of the three polymorphs of Al_2SiO_5, with special reference to Al-coordination polyhedra and structural sites. Comment on the importance of these minerals for petrologists (use **diagrams** along with text to illustrate your answer).

(15) 3. Give the exact chemical formula for each of the following minerals.

(a) Aragonite
(b) Leucite
(c) Microcline
(d) Ilmenite
(e) Enstatite
(f) muscovite
(g) Anthophyllite
(h) Almandine
(i) Cristobalite
(j) Fayalite

(8) 4. To which crystal system does each of these point groups belong:

mm2, 422, 23, 2/m, 432, 3/m 3/m 3/m, 6/m, 2

(17) 5. (a) List all the crystal systems, and give a mineral example for each system.

(b) What is the point group that each of the following five stereographic projections represent;