

## Example GEOL 17.01 Lecture Midterm (from Fall 2006)

1. Complete the table below, based on the mineral formulae provided

Mineral	Silicate Structure	Predicted Properties
$\text{Na}_2\text{Mg}_3\text{Al}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$		
$\text{ZrSiO}_4$		
$\text{Ca}_2\text{Al}(\text{AlSi}_3\text{O}_{10})(\text{OH})_2$		

2. Complete the table below, based on the mineral formulae provided

Mineral	Ions with CN=4	Ions with CN=6	Ions with CN=8-12
$\text{Na}_2\text{Mg}_3\text{Al}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$			
$\text{ZrSiO}_4$			
$\text{Ca}_2\text{Al}(\text{AlSi}_3\text{O}_{10})(\text{OH})_2$			

3. What type of bond would predominate in each of the following minerals?

KCl \_\_\_\_\_

NiAs \_\_\_\_\_

Cu \_\_\_\_\_

4. To which crystal systems could each of the following minerals belong based on their optical properties:

Biaxial, inclined extinction \_\_\_\_\_

Uniaxial negative \_\_\_\_\_

Parallel extinction \_\_\_\_\_

5. Explain why most salts are on the low end of Mohs' Hardness Scale whereas most silicates are at the high end.

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6. Explain why some minerals are strongly colored, whereas others are not.

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7. Explain why most minerals exhibit interference colors under cross-polarized light, whereas a small number of minerals appear black with this optical configuration.

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8. Determine the crystal system to which each of the three block models would belong based on their symmetry

Block 1: \_\_\_\_\_

Block 2: \_\_\_\_\_

Block 3: \_\_\_\_\_