

NAME _____

89.301 - MINERALOGY
BRAGG'S LAW CALCULATIONS

1. An unknown sample is analyzed by x-ray diffraction. A copper x-ray tube is used ($K\alpha = 1.54\text{\AA}$). A diffracted beam occurs at 19.4° . Calculate the d spacing.

2. An unknown sample is analyzed by x-ray diffraction. A copper x-ray tube is used ($K\alpha = 1.54\text{\AA}$). The following data are obtained. Complete the table below.

| θ | Intensity (cps) | d (\AA) | I/I_0 |
|----------|-----------------|--------------------|---------|
| 11.0 | 772 | | |
| 15.5 | 15448 | | |
| 20.6 | 4788 | | |
| 25.5 | 4557 | | |

The sample was collected from a carbonate rock. X-ray powder diffraction data for calcite and dolomite are reproduced below. Identify the mineral.

| Calcite (5-586) | | | | |
|------------------|------|------|------|------|
| I/I_1 | 100 | 18 | 18 | 12 |
| d | 3.04 | 2.29 | 2.10 | 3.86 |
| Dolomite (11-78) | | | | |
| I/I_1 | 100 | 30 | 30 | 5 |
| d | 2.89 | 2.19 | 1.79 | 4.03 |