

3.5: More Definitions- Order and Class

An important definition is the **order** of a group. The order (h) is simply the number of symmetry elements in the group. For the C_{2v} point group, the order is $h = 4$.

Another important concept defines the number of **classes** of operations a point group contains. Two operations (A and B) belong to the same class if there is a third operation (C) in the group that relates them by the **similarity transform**

$$C^{-1}AC = B$$

According to this definition, the operations A and B are said to be **complementary**. A complete set of complementary operations within a group defines a **class**. This will be demonstrated later, using the C_{3v} point group operations.

In the case of the C_{2v} point group, no two elements are in the same class. This has some very important ramifications for the point group. A group for which this the case is said to be an **abelian group**. Not all point groups will have this property however.

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