CHEM1002 Worksheet 2 – Answers to Critical Thinking Questions

The worksheets are available in the tutorials and form an integral part of the learning outcomes and experience for this unit.

**Model 1: Naming Organic Molecules**

1. See below.

   ![2,4-dimethylpentane](image1)

   ![2,3-dimethylpentane](image2)

   ![2,2-dimethylpentane](image3)

   ![3,3-dimethylpentane](image4)

2. See above.

3. Yes.

4. See above.

**Model 2: Isomerism**

1. All of the molecules are constitutional isomers except those are conformational (see Q2) or configurational / stereoisomers (see Q3).

2.

3.

4. Top row: (i) cyclic ether & chloride, (ii) cyclic ether (epoxide) & chloride, (iii) alkene, chloride & alcohol and (iv) cyclic ether (epoxide) and chloride.

Second row: (i) ketone & chloride, (ii) cyclic ether & chloride, (iii) ether & chloride, (ii) cyclic ether (epoxide) & halide, (iii) alkene, chloride & alcohol and (iv) acid chloride.

Third row: (i) alkene, chloride & alcohol, (ii) alkene, chloride & alcohol, (iii) enol & chloride, (iv) alkene, chloride & alcohol and (v) cyclic ether & chloride.
5. 'Staggered' conformation:

6. 'Eclipsed' conformation:

The C-H bonds at the two ends of the molecule are *eclipsed* with respect to each other.

**Model 3: Polar Reactions**

1. See below.

2. A bond would need to break.

3. The π bond in the C=O group is the weakest and would break.

4. See below.

5. See below.

6. See below.