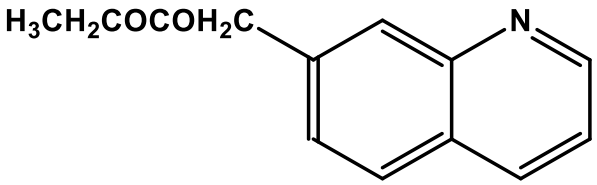
1.3. Exercises (Module 4a)

1.3.1. *Exercise 1*

Without looking in a database, draw the structural formulas of at least ten isomers with the molecular formula: C_3H_6O. Don't include isotopes or radicals.

1.3.2. *Exercise 2*

Expand the following contracted label to form the full 2D structural formula:



a) In which direction did you read the contracted label?
b) How does the full structural formula appear if the label is read the other way?
c) Which direction is the IUPAC convention?
d) Re-write the contracted label to clarify the intended meaning.
e) What is the useful lesson here?

1.3.3. *Exercise 3*

Resolve each of the following the systematic names listed for Vitamin C into structural formulae using each of the systems below. Is the expected stereochemistry represented?

a) (*R*)-3,4-dihydroxy-5-((*S*)-1,2-dihydroxyethyl)furan-2(5*H*)-one
b) (*R*)-5-((*S*)-1,2-dihydroxyethyl)-3,4-dihydroxyfuran-2(5*H*)-one
c) (2R)-2-[(1S)-1,2-dihydroxyethyl]-3,4-dihydroxy-2H-furan-5-one
d) (5R)-[(1S)-1,2-dihydroxyethyl]-3,4-dihydroxy-3-oxolen-2-one

1. openmolecules: http://www.openmolecules.org/name2structure
2. OPSIN: http://opsin.ch.cam.ac.uk/
3. CACTUS: http://cactus.nci.nih.gov/chemical/structure
4. ChemSpider: http://www.chemspider.com/
5. PubChem: https://pubchem.ncbi.nlm.nih.gov/